SERVICE MANUAL
PARTS LIST

MODEL VT-350

AKAI

EJECT
RWD
STOP
F.FWD
PLAY
REC
SOUND DUB
UNLOAD
LOAD
BATT
NORMAL
FRAME SPEED
SLOW
STILL
FAST
AKAI
PORTABLE CASSETTE VTR
VT-350

AKAI PORTABLE VIDEO CASSETTE RECORDER

MODEL VT-350

SECTION 1 SERVICE MANUAL 3
SECTION 2 PARTS LIST 51
SECTION 3 SCHEMATIC DIAGRAM 72

SECTION 1

SERVICE MANUAL

TABLE OF CONTENTS

I. TECHNICAL DATA 4
II. DISMANTLING OF UNIT 5
III. CONTROLS 7
IV. PRINCIPAL PARTS LOCATION 8
V. FUNCTION DESCRIPTION 10
VI. CIRCUIT OPERATION 11
  1. CAPSTAN MOTOR SERVO CIRCUIT 11
  2. HEAD MOTOR CIRCUIT 13
  3. AEC RECORDING 14
VII. VIDEO HEAD ASSEMBLY ADJUSTMENT 16
  1. VIDEO HEAD REPLACEMENT 16
  2. HEAD TIP PROTRUSION ADJUSTMENT 16
  3. VIDEO HEAD HEIGHT ADJUSTMENT 16
  4. 180° ANGLE ADJUSTMENT 17
  5. VIDEO HEAD HEIGHT CONFIRMATION 18
  6. SLIP RING AND BRUSH ADJUSTMENT 18
  7. VIDEO HEAD BLOCK POSITIONING ADJUSTMENT 19
  8. DRUM AND HEAD PLATE ADJUSTMENT 20
  9. MAGNET AND PU HEAD ADJUSTMENT 21
VIII. MECHANICAL ADJUSTMENT 22
  1. KEY OPERATION ADJUSTMENT 22
  2. TAPE LOAD AND UNLOAD MECHANISM ADJUSTMENT 22
  3. TORQUE ADJUSTMENT 25
  4. PINCH ROLLER ADJUSTMENT 28
  5. PLAY PLUNGER ADJUSTMENT 29
  6. RELEASE PLUNGER ADJUSTMENT 29
  7. AEC MECHANISM ADJUSTMENT 30
  8. SPEED SWITCH (SW911) ADJUSTMENT 31
  9. TAPE TRANSPORTATION ADJUSTMENT 32
  10. HOW TO REPLACE REEL MOTOR PULLEY 33
IX. ELECTRICAL ADJUSTMENT 34
  1. SERVO P.C BOARD (PY-5203) ADJUSTMENT 34
  2. SIGNAL P.C BOARD (PY-5022) ADJUSTMENT 36
  3. SSG P.C BOARD (PY-5200) CONFIRMATION 40
X. CLASSIFICATION OF VARIOUS P.C BOARDS 41
  1. P.C BOARD TITLE AND IDENTIFICATION NUMBER 41
  2. COMPOSITION OF VARIOUS P.C BOARDS 42

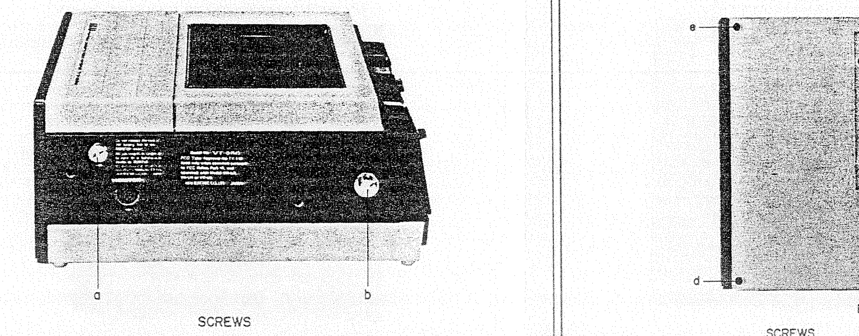
I. TECHNICAL DATA

TV SIGNAL	U.S. Standard TV Signal (or CCIR Standard TV Signal)
RECORDING SYSTEM	Twin rotating head, helical scanning system
RESOLUTION	More than 240 lines
VIDEO SIGNAL TO NOISE RATIO	Better than 40 dB
AUDIO FREQUENCY RESPONSE	100 to 10,000 Hz
AUDIO SIGNAL TO NOISE RATIO	Better than 43 dB
TAPE SPEED	69.1 mm/sec (CCIR 67.9 mm/sec)
RECORDING/PLAYBACK TIME	30 minutes (with VK-30 tape)
BATTERIES	2 rechargeable 6V Batteries
BATTERY USING TIME	60 continuous minutes
DIMENSIONS	263(W) x 124(H) x 296(D)mm, (10.3 x 4.9 x 11.6″)
WEIGHT	6.07 kg (including shoulder strap and tape) (15.2 lbs)
BATTERIES	1.3 kg (2.9 lbs)

II. DISMANTLING OF UNIT

In case of trouble, etc. necessitating dismantling, please dismantle in the order shown in the photographs. Reassemble in reverse order.

1



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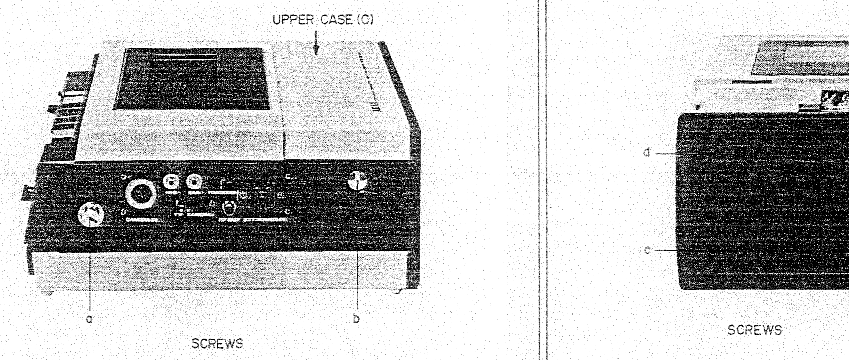
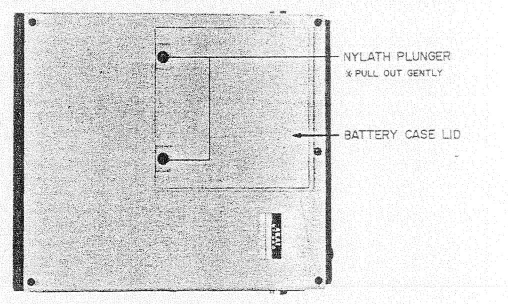
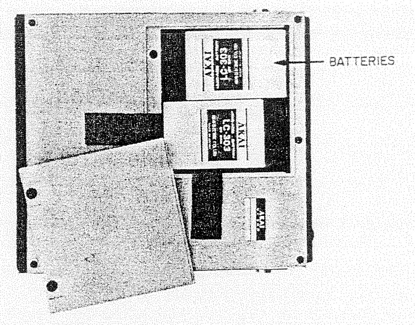

UPPER CASE (C)
a
b
SCREWS

3


NYLATH PLUNGER
※ PULL OUT GENTLY
BATTERY CASE LID

4



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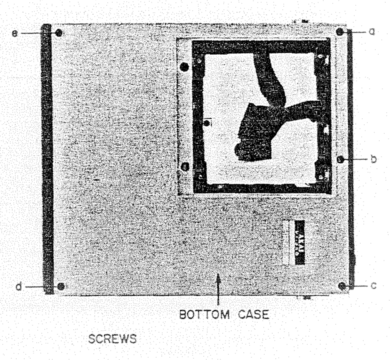
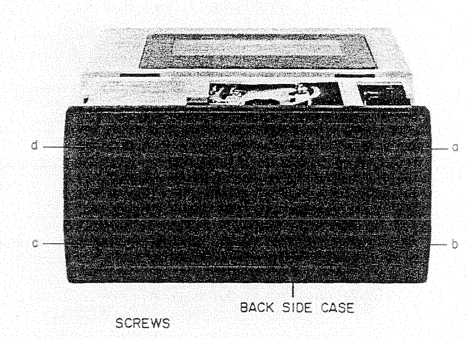
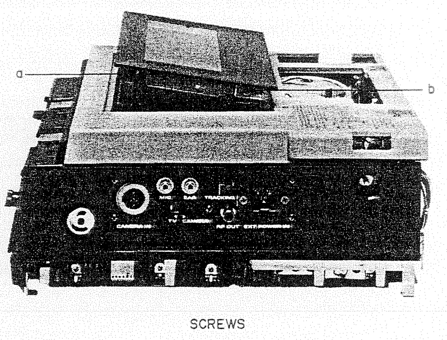

e
a
b
d
c
BOTTOM CASE
SCREWS

6


d
a
c
b
BACK SIDE CASE
SCREWS

7



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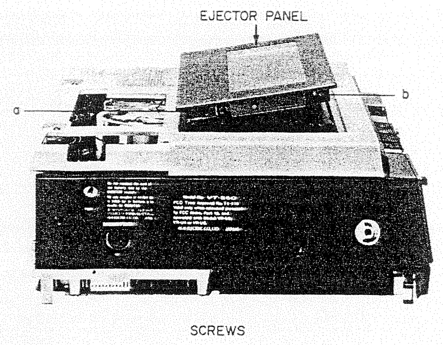
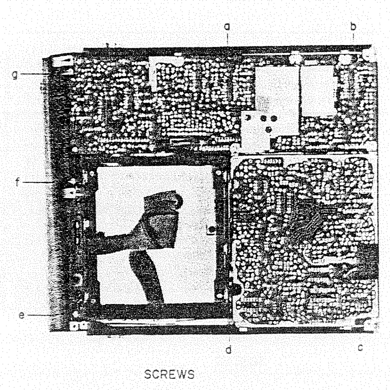

EJECTOR PANEL
a
b
SCREWS

9


a
b
g
f
e
d
c
SCREWS

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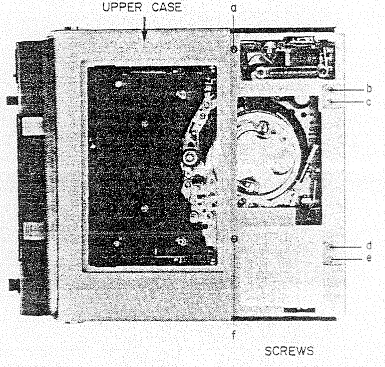
UPPER CASE
a
b
c
d
e
f
SCREWS

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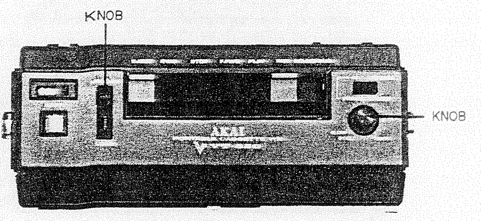

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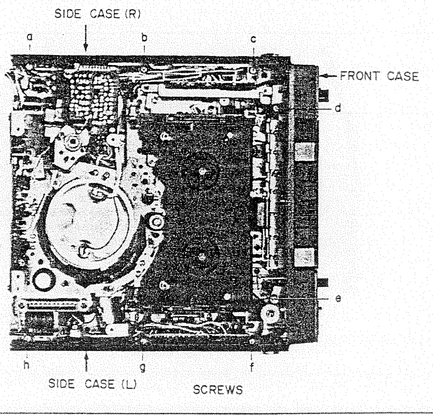
SIDE CASE (R)
a
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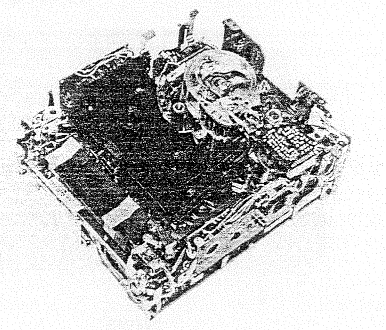
FRONT CASE
d
e
h
g
f
SIDE CASE (L)
SCREWS

13



III. CONTROLS

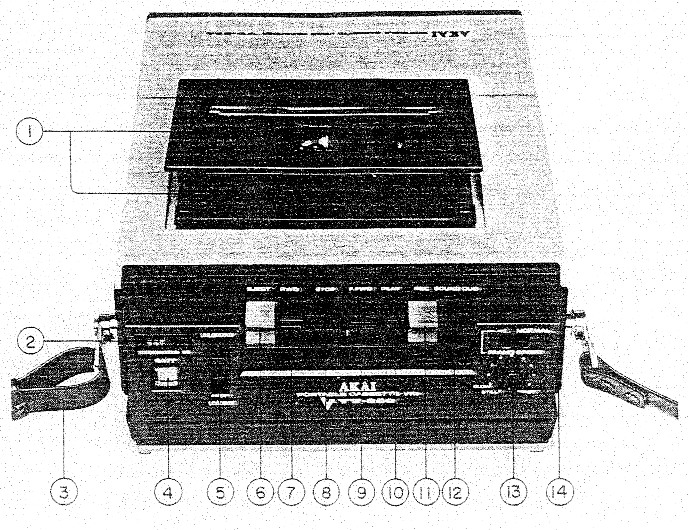

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Fig. 3-1

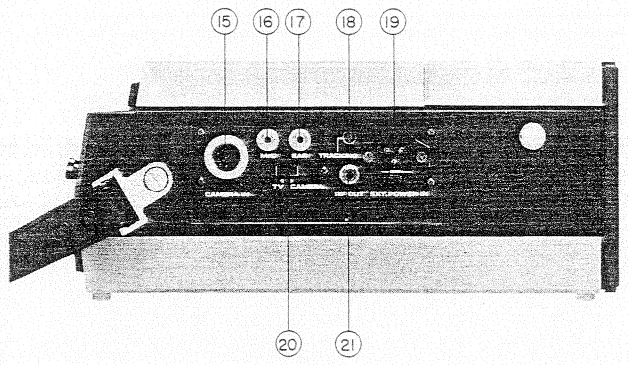

Fig. 3-2

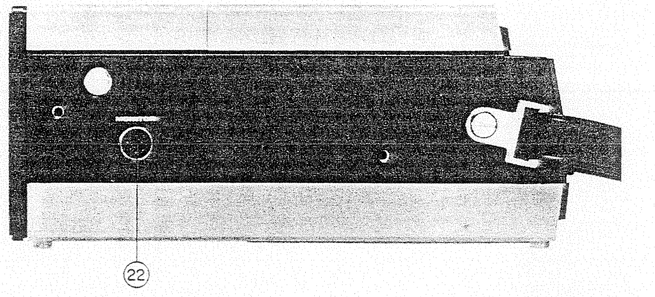

Fig. 3-3

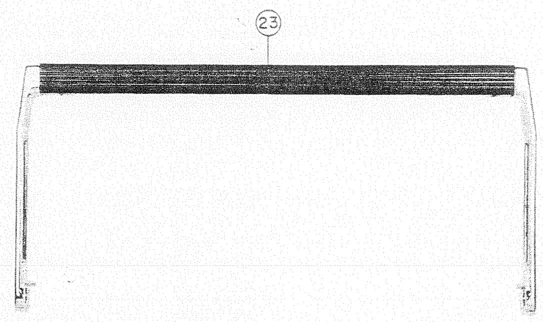

Fig. 3-4

1. CASSETTE RECEPTACLE & TAPE VIEW WINDOW
2. INDEX COUNTER
3. SHOULDER STRAP
4. BATTERY LEVEL INDICATOR
5. TAPE LOAD SWITCH
6. EJECT KEY
7. REWIND KEY
8. STOP KEY
9. FAST FORWARD KEY
10. PLAY KEY
11. RECORDING KEY
12. SOUND DUBBING KEY
13. FRAME SPEED CONTROL
14. SPEED SWITCH
15. CAMERA IN JACK
16. EXTERNAL MICROPHONE JACK
17. EARPHONE JACK
18. TRACKING CONTROL
19. EXTERNAL MICROPHONE JACK
20. TV-CAMERA SWITCH
21. RF OUT JACK
22. MONITOR CONNECTOR JACK
23. VTR HANDLE

IV. PRINCIPAL PARTS LOCATION

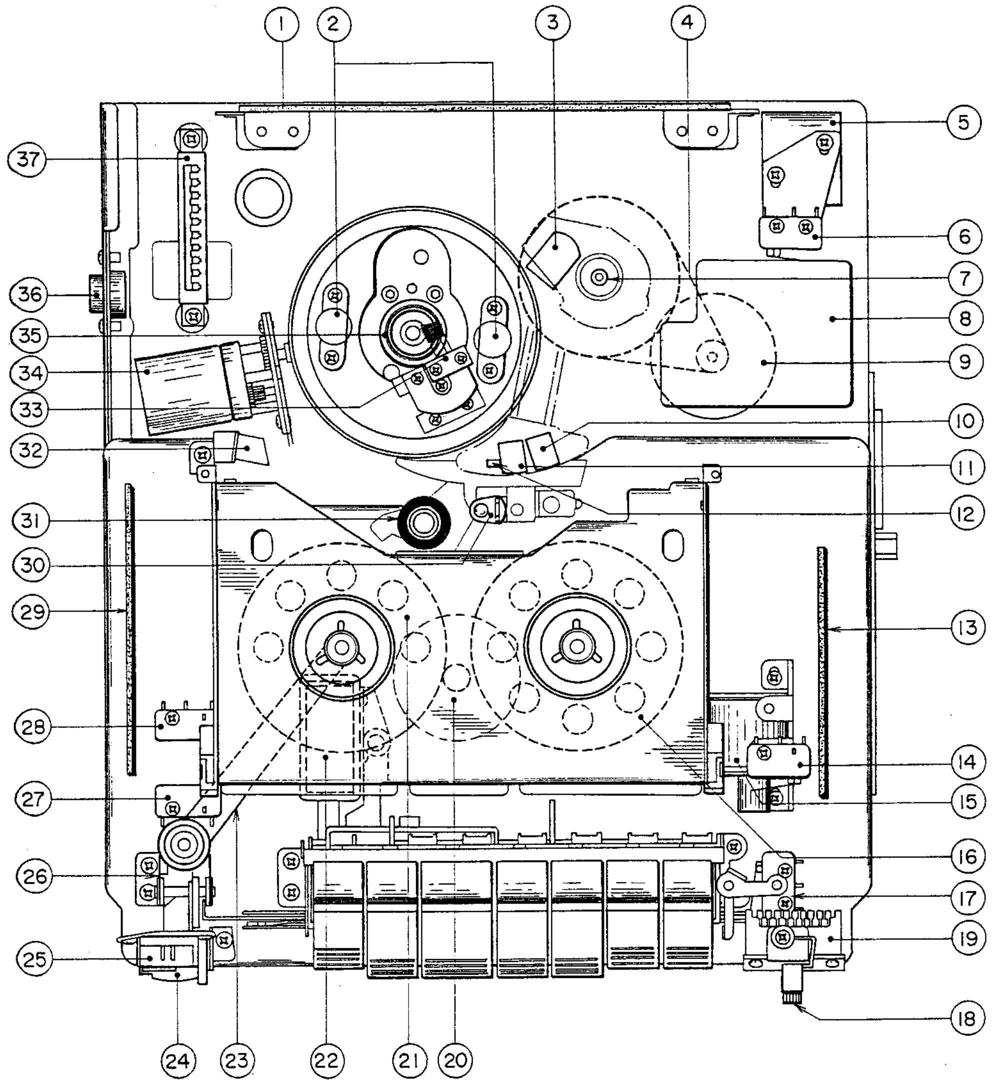

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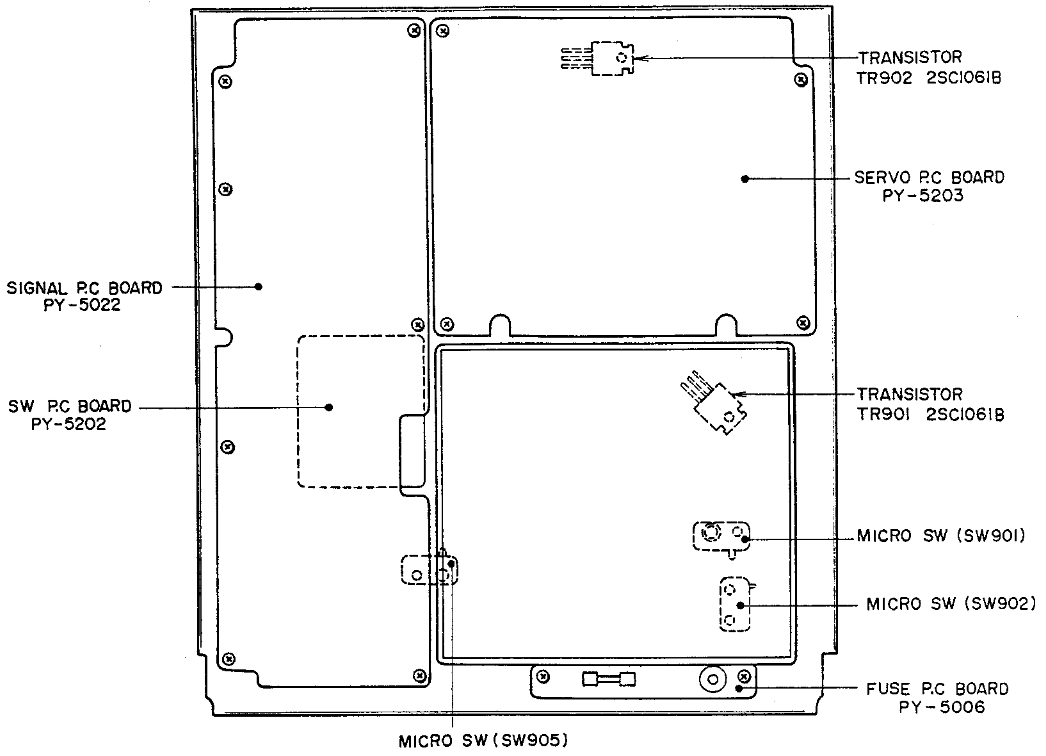
Fig. 4-1

1. SSG P.C BOARD (PY-5200)
2. PU HEAD (B)
3. CTL HEAD
4. FLYWHEEL BELT
5. PLAY SOLENOID (SL902)
6. MICRO SWITCH (Upper) (SW909)
   MICRO SWITCH (Lower) (SW908)
7. CAPSTAN SHAFT
8. PV PLG P.C BOARD (PY-2200)
9. CAPSTAN MOTOR
10. FULL TRACK ERASE HEAD
11. SIDE TRACK ERASE HEAD
12. CDS (CDS901)
13. CONNECTOR P.C BOARD (PY-5003)
14. MICRO SWITCH (SW910)
15. REC SOLENOID (SL903)
16. SUPPLY REEL TABLE
17. MICRO SWITCH (Upper) (SW906)
    MICRO SWITCH (Lower) (SW907)
18. FRAME SPEED CONTROL (VR901)
19. SPEED SWITCH (SW911)
20. REEL MOTOR
21. TAKE-UP REEL TABLE
22. RELEASE SOLENOID (SL901)
23. COUNTER BELT A
24. BATTERY LEVEL IND. (M901)
25. COUNTER
26. COUNTER BELT
27. MICRO SWITCH (SW903)
28. MICRO SWITCH (SW904)
29. SHUT OFF P.C BOARD (PY-5201)
30. LAMP (IND901)
31. PINCH ROLLER
32. CDS (CDS902)
33. BRUSH
34. GEAR MOTOR
35. SLIP RING
36. MONITOR CONNECTOR (J904)
37. RF CONNECTOR (J903) (US only)



TRANSISTOR TR902 2SC1061B
SERVO P.C BOARD PY-5203
SIGNAL P.C BOARD PY-5022
SW P.C BOARD PY-5202
TRANSISTOR TR901 2SC1061B
MICRO SW (SW901)
MICRO SW (SW902)
FUSE P.C BOARD PY-5006
MICRO SW (SW905)

Fig. 4-2

V. FUNCTION DESCRIPTION

Mode	Function Key	Picture and Sound	Remarks
Stop	All Keys OFF	No Picture No Sound	Power cut-off state.
PB	Load SW ON PB Key ON	PB Picture and Sound	Playback state.
E-E	Load SW ON Rec Key ON	E-E Picture and Sound	Tape is loaded but not running
Rec Stand-by	Load SW ON Rec Key ON PB Key ON	E-E Picture and Sound	Camera Start Switch OFF state. Tape is loaded but not running. This state is not established in TV mode.
Rec	Load SW ON Rec Key ON PB Key ON	E-E Picture and Sound	Camera Start Switch ON state or TV-Camera Switch to TV position.
FF, RWD	FF or RWD Key ON	Raster only	FF, RWD at both Load Switch ON & OFF. Slower Speed with Load Switch ON.
Load	Load SW ON	No Picture No Sound	Tape is loaded state.
Unload	Load SW OFF	No Picture No Sound	Tape is unloaded state.
Sound Dub	Sound Dub Key ON PB Key ON	PB Picture E-E Sound	Using Mic Jack with external Microphone.
Still	Load SW ON PB Key ON Frame Speed Volume to STILL	Still Picture No Sound	Stopped Picture state.
Frame Speed	Load SW ON PB Key ON Speed SW to FRAME SPEED	Slow speed picture No Sound	The frame speed control is featured for convenience in searching for the exact "frame" or still picture that you're looking for.
Eject (HOP UP)	Eject Key ON (Depress)	No Sound No Picture	Eject Key works at all Key OFF position position only.

NOTE: Load SW ON = Load SW to Load.
Load SW OFF = Load SW to Unload.

VI. CIRCUIT OPERATION

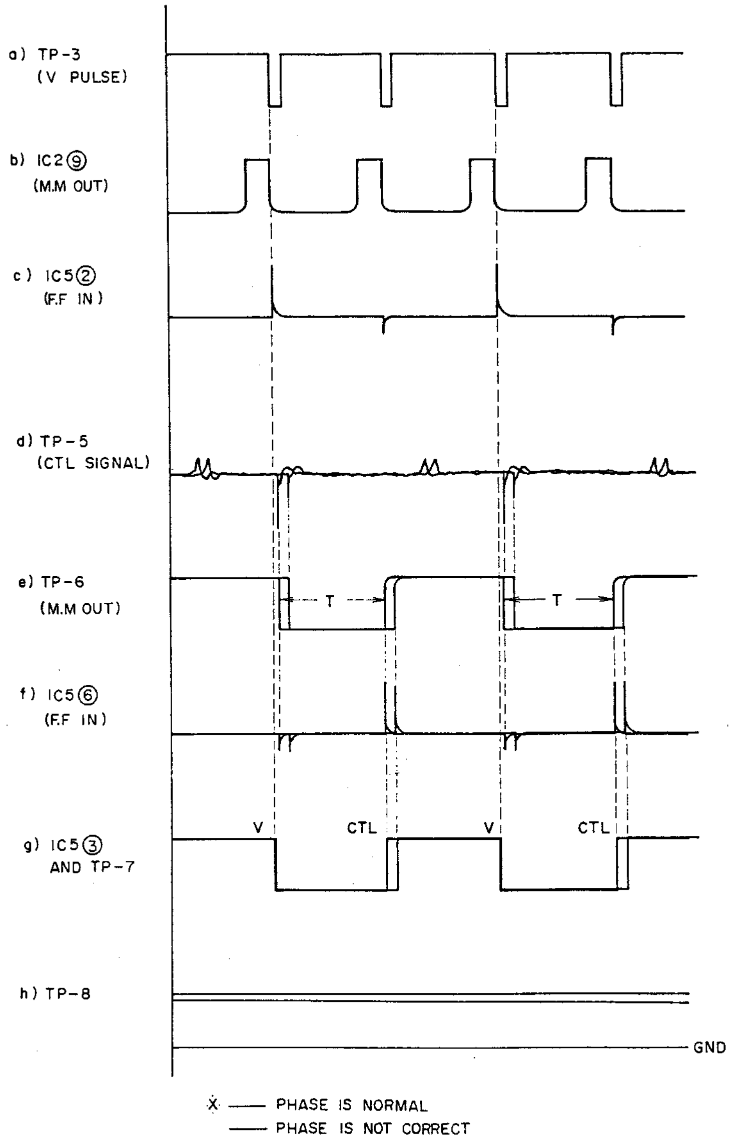


Fig. 6-1

1. CAPSTAN MOTOR SERVO CIRCUIT (Refer to Schematic Diagram of Servo Circuit)

The Capstan Motor Servo Circuit is composed of the Speed Control Circuit using the FG (Frequency Generator) pulse from the capstan motor and the Phase Control Circuit using the CTL Signal and V pulse. During the REC Mode, the capstan motor rotates at a constant speed using the Speed Control Circuit only.

Model VT-350 is equipped with the Still and Frame Speed Controls and uses the capstan motor speed control circuit.

1) Speed Control Circuit

The FG pulse from the capstan motor enters terminals ③ and ④ in the schematic diagram, passes through H.P.F. (C36, R110) and reaches the base of TR26. The output of TR26 is fed into the base of TR27 and a sawtooth wave is produced in the circuit formed by TR27, R114 and C39.

The intervals of this sawtooth wave are used to turn on and off TR28 to control the capstan Motor Drive Amp. TR29 and TR30, thereby maintaining a constant capstan motor speed.

If, for example, the capstan motor speed is reduced, the FG pulse interval becomes longer. This causes the sawtooth wave interval to be longer, resulting in additional current flowing in

TR28. Consequently, the voltage at the base of TR29 falls, permitting greater current to flow in TR29 and TR30. In this way, the voltage difference between the ends of the capstan motor becomes greater, causing its speed to increase. However, if the capstan motor speed increases, the FG pulse interval becomes shorter so the voltage difference between the ends of the capstan motor becomes smaller, thus decreasing the speed. The operation controls the capstan motor speed.

2) Phase Control Circuit
(PB Mode/Tracking SW. OFF)

a) PB Mode (With Tracking VR turned OFF)

The V pulse, generated in the SSG Circuit, is fed into TP-3, passes through the Mono-Multi Circuit for noise prevention formed by IC2 (8~10) and TR12 and enters the Flip-Flop Circuit in IC2 (1~6), where the frequency is halved. The pulse is then applied to the Flip-Flop in IC5 (1~6) (Phase Comparator).

The CTL signal recorded on the tape comes from P3 ⑤, passes through TR19, is amplified in IC9 and applied to the base of TR20. The output, phase-inverted in TR20, enters IC5 ⑥ via the Mono-Multi Circuit formed by IC5 (8~10) and TR21.

Therefore, the input applied to the Flip-Flop in IC5 (1~6) is as shown Fig. 6-1 c) and f).

The Flip-Flop output of IC5 ③ (See Fig. 6-1 g)) is applied to IC4 ⑧. IC4 is a switching circuit and, since a voltage of +9V is present at IC4 (9, 12, 13) during PB mode, the output of IC4 is constantly at a low level. Thus, the signals in IC4 ③ and IC4 5 and always at a high level regardless of the input applied to IC4 ①.

Since IC4 ⑨ is maintained at a high level, the output of IC4 ⑩ has the reverse phase of that of IC5 ③. In this case, since IC4 ⑤ is at a high level, a wave with identical phase to that at IC5 ③, i.e. the waveform shown in Fig. 6-1 g), is present at IC4 ④. The output of IC4 ④, smoothed by R99, C33, R100 and C34, passes through the differential amplifier TR24 and TR25, and TR31, thereby causing the voltage at the emitter of TR28 to be varied to operate the Drive Amp of TR29 and TR30 thus controlling the phase of the capstan motor.

When, for example, the phase lags as indicated in red in Fig. 6-1 d), the red waveform in g) is smoothed by R99, R100, C33 and C34 and is fed into the differential amplifier TR24 and TR25.

Because this input of the differential amplifier is at a lower level than in normal operation, its output (obtained at the collector of TR24) is at a higher level. The output passes through the Twin T Filter (to reduce ripples) formed by R125~R130 and C43~C45 and enters the base of TR31, thus allowing a greater current than in normal operation to flow between the collector and the emitter of TR31 to make the voltage at the emitter of TR28 drop. Since this causes the voltage at the collector of TR28 to drop, a greater current than in normal operation flows in TR29 and TR30 to temporarily raise the voltage difference between the ends of the capstan motor, thereby speeding up the capstan motor to restore the phases of the CTL and V pulses to the normal condition.

b) PB Mode (With the Tracking VR turned ON)

When the Tracking VR is ON, a voltage of +9V, is supplied from P3 ②, to a middle point between R91 and R92, and switching on TR23 and TR24. Therefore, a period of the Mono-Multi Circuit formed by IC5 (8~10) and TR21, i.e. the portion indicated by the T in Fig. 6-1 e), is varied by adjusting the Tracking VR, thus achieving synchronization.

Other operations are the same as when the Tracking VR is turned off.

3) Still Mode

During the Still Mode, the Normal/Slow slide Switch (SW911, S1-3) is set to "Slow" while the switch interlocking with the Frame Speed Control Volume is set to "Normal Close". Therefore, P4 ⑨ and ⑩ are short-circuited and no voltage is present across the terminals of the capstan motor, thus causing the capstan motor to stop in the Still Mode.

4) Frame Speed Control

When the Normal/Slow Slide Switch (SW911, S1-2) is set to "Slow", +B is applied to TR28 not via R116, 68 kohms but via the Frame Speed Control Volume (VR902, 1 kohms).

Therefore, the potential at the base of TR29 increases and the capstan motor speed decreases. The capstan motor speed can be varied by adjusting VR902 (within one sixth of the normal speed). In this case, the SW911 (S1-1) is also set to "Slow" and the FG pulse passes neither through the H.P.F. formed by C36 and R110 nor through TR26 but is applied directly to the base of TR27. This is because both the frequency and signal level of the FG Pulse are low when the switch is set to "Slow".

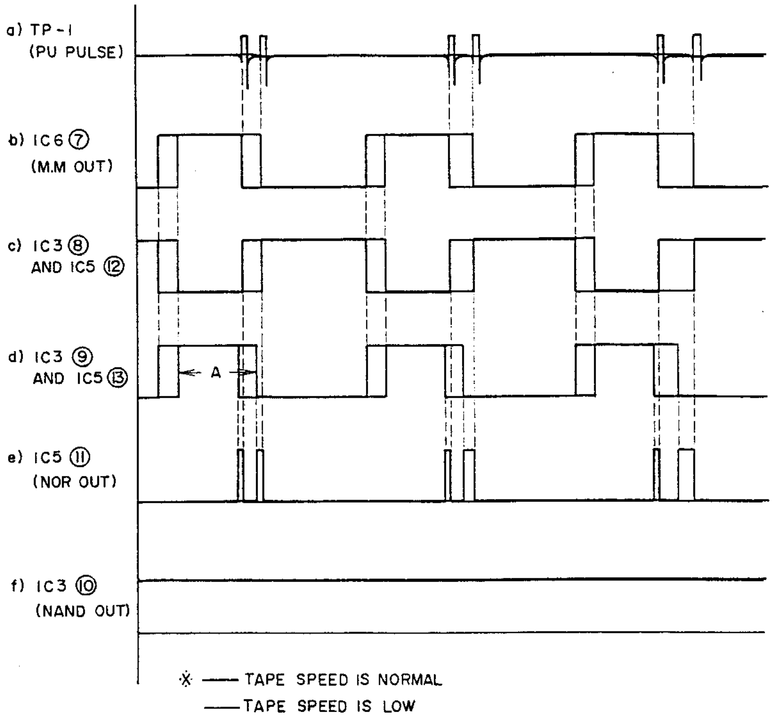


Fig. 6-2

2. HEAD MOTOR CIRCUIT
(Refer to Schematic Diagram of Servo Circuit)

The head motor circuit is composed of the Speed Control Circuit using the PU pulse detected by the PU head and the Phase Control Circuit using the V pulse and the PU pulse. The circuit operation in the Rec Mode is the same as in the PB mode. In the FF and RWD modes, the head motor speed is kept constant using the PU pulse only.

1) Speed Control Circuit

The PU pulse detected by the PU head (PU1) passes through TR1 and IC1 and is applied to the Mono-Multi Circuit formed by IC6 (4~9) and TR6.

The output (Fig. 6-2 b)) of the Mono-Multi Circuit becomes the input (Fig. 6-2 c)) of IC3 ⑧ and IC5 ⑫. The output of the Mono-Multi Circuit composed of IC6 (4~9) and TR6 is also fed into the Mono-Multi Circuit composed of IC6 (1~3) and TR8. The output of this Circuit becomes the input (Fig. 6-2 d)) of IC3 ⑨ and IC5 ⑬.

In the NOR circuit of IC5 (11~13) and NAND circuit of IC3 (8~10), phase comparison is performed and the output drives the Head Motor Drive Circuit composed of TR9, TR10, TR11 and TR902 (TR902 is connected to P6 ① ~ ③), thereby controlling the head motor.

If, for example, the head motor speed is reduced, a period of the PU pulse becomes expanded as indicated the red waveform in Fig. 6-2 a). In this case, since the combination of the inputs of IC3 NAND circuit are either high/low or low/low, its output always has a high level, so D7 is inverse biased. Thus, when low/low inputs are applied to the input of IC5 NOR circuit, the red waveform in Fig. 6-2 e) is obtained. Its output passes through D6 and is smoothed by C4 and C5, thus causing greater current to flow in TR9, TR10, TR11 and TR902 to increase the head motor speed.

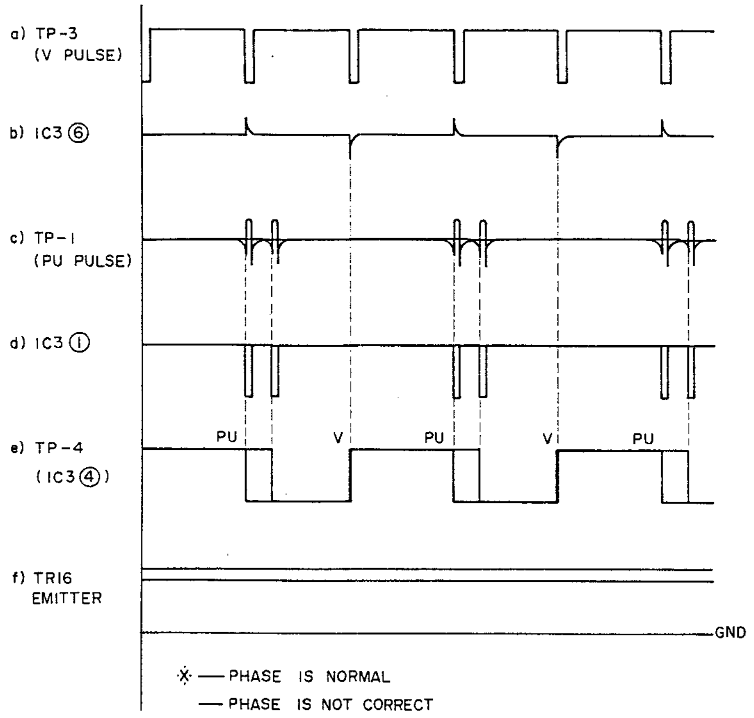


Fig. 6-3

2) Phase Control Circuit

The V pulse, applied from P5 ①, passes through the Mono-Multi Circuit of IC2 (8~10) and TR12 and enters the flip-flop circuit of IC2 (1~6), where the frequency is halved. The output, with the halved frequency, is fed into the flip-flop circuit of IC3 ⑥. The PU pulse, detected by the PU head (PU1), enters IC3 ① via TR1, IC1 (11~13) and IC1 (8~10). Thus, the inputs shown in Fig. 6-3 d) and e) are applied to the flip-flop circuit (phase comparator) of IC3 (1~6).

The output of IC3 (1~6) flip-flop circuit, triggered by the PU and V pulses, is then smoothed by the smoothing circuit composed of R60, R61, C16 and C17, amplified by IC8 and TR16 and fed into IC6 ③, thus controlling the portion A in Fig. 6-2 d) (a period of mono-multi).

If the phase of the head motor lags, a period of the PU pulse indicated in red in Fig. 6-3 c) is varied according to the phase difference as shown in red in Fig. 6-3 e), thereby raising the potential at IC6 ③. This causes the interval A in Fig. 6-2 d) (a period of mono-multi) to be shorter, resulting in a widened pulse width as shown in Fig. 6-2 e). Thus, the head motor speed is temporarily increased to compensate for the phase difference.

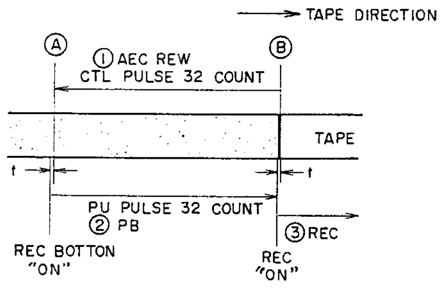


Fig. 6-4

3. AEC RECORDING

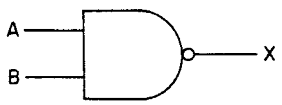
1) General Operation

The AEC (Automatic Editing Control) of the Model VT-350 permits the recording to be stopped and restarted, thus enabling instantaneous editing without blurs and noise at the editing point.

When, for example, recording is stopped by the AEC at point Ⓑ as shown in Fig. 6-4, the tape transport automatically stops at point Ⓐ after counting 32 CTL pulses. When the recorder is set to Rec. mode again, the tape is forwarded from point Ⓐ to point Ⓑ in the PB mode. (In the meantime, the Capstan Servo Circuit compares CTL and V pulses to compensate for the phase difference of the tape.) Then, recording resumes automatically from point Ⓑ after counting 32 CTL Pulses.

In this way, recording editing is performed automatically. The portion "t" in Fig. 6-4 represents the extra tape travel due to inertia, and broke timing etc. in the AEC Rewind. It is so short that there are virtually no blurs and noise.

NAND

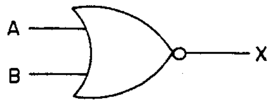


$X = \overline{A \cdot B}$

A	B	X
L	L	H
L	H	H
H	L	H
H	H	L

Fig. 6-5

NOR



$X = \overline{A + B}$

A	B	X
L	L	H
L	H	L
H	L	L
H	H	L

Fig. 6-6

2) From the REC Mode to the Stop and AEC REW Modes (Refer to the Block Diagram)

When the REC mode is changed to the Stop mode, Micro Switch SW909 is changed from "Normal Open" to "Normal Close". The charge held by C901 causes TR3 and TR4 in the PV PLG Circuit and rewind Plunger SL903 to be ON, thus putting the recorder in the Rewind mode.

3) From AEC REW to the Stop Mode (When the CTL pulse is present.) (Refer to Servo Circuit)

The CTL pulse is applied to IC2 ⑫ via TR19, IC9 and TR20. In this case, a voltage of approximately +B is applied to TR14 and IC2 ⑬ via P5 ②, thus TR14 is ON and IC2 ⑬ is at high level. Accordingly, a pulse is present at the output of IC2 ⑪ in the IC2 (11~13) NAND circuit because of the CTL Pulse and this enters IC7 ①. Since TR14 is ON, IC7 ② is at Low level. When IC7 ② is at low level, the reset pulse is available at IC7 ④ after 32 CTL pulses are fed into IC7 ①. (Refer to PV PLG Circuit) This reset pulse causes TR1 and TR2 to be ON and TR4 to be OFF and resets the rewind plunger SL903, thus setting the recorder in the Stop mode. The AEC Rewind requires about 0.3 to 0.4 seconds.

4) From AEC REW to the Stop Mode (When no CTL pulse is present) (Refer to PV PLG Circuit)

If the tape is stopped by AEC when recording a tape on which no signals have been recorded, the tape will be rewound to the end because there is no reset pulse (CTL pulse) present. To avoid this, the recorder is equipped with a prevention circuit. As soon as the rewinding starts with TR4 ON, C5 begins charging. While C5 is being charged, TR3 and TR4 are ON and thus rewinding continues. When C5 is fully charged, TR3 and TR4 are turned OFF, thus causing the rewind plunger to be OFF and setting the recorder in the Stop mode.

In this way, the time constants of C5, R12, R9 etc. permit the tape to be automatically stopped after being rewound for about 2 seconds, even if no reset pulse is present.

5) From the Stop to REC Mode (Refer to Servo Circuit)

When the tape is stopped after AEC rewind and set in the REC mode, a voltage of +B enters P5 ⑥, passes through D15 and R135 and causes IC2 ⑫ to be at high level, while at the same time turning TR14 ON and causing IC7 ② to be at low level.

Consequently, an output is obtained at IC2 ⑪ corresponding to the PU pulse applied to IC2 ⑬ and this enters IC7 ①. Since IC7 ② is at low level, a reset pulse appears at IC7 when 32 PU pulses are applied to IC7 ①. This reset pulse switches ON TR15 and then Relay RL1.

Relay RL1 becomes ON at point Ⓑ shown in Fig. 6-4, thereby setting the Rec. CTL. Amp. etc. to the Rec. Mode.

[Reference]:

VII. VIDEO HEAD ASSEMBLY ADJUSTMENT

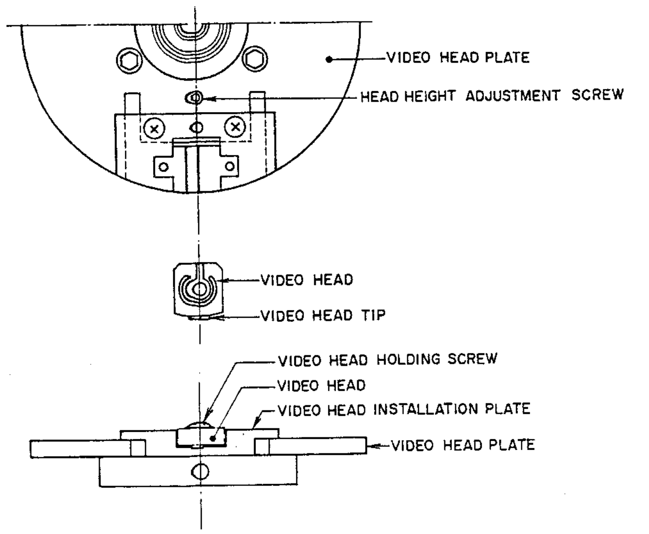

VIDEO HEAD PLATE
HEAD HEIGHT ADJUSTMENT SCREW
VIDEO HEAD
VIDEO HEAD TIP
VIDEO HEAD HOLDING SCREW
VIDEO HEAD
VIDEO HEAD INSTALLATION PLATE
VIDEO HEAD PLATE

Fig. 7-1

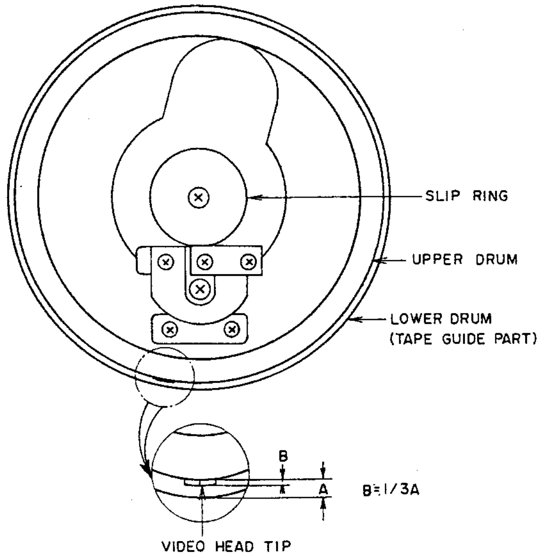

SLIP RING
UPPER DRUM
LOWER DRUM (TAPE GUIDE PART)
B
A
B≒1/3A
VIDEO HEAD TIP

Fig. 7-2 Top View of Video Head Block

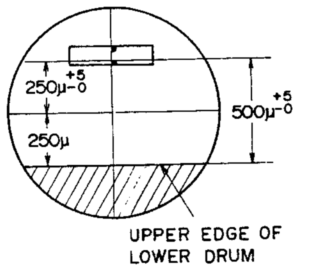

250μ +5 -0
250μ
500μ +5 -0
UPPER EDGE OF LOWER DRUM

Fig. 7-3

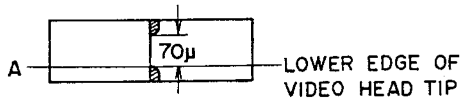

A
70μ
LOWER EDGE OF VIDEO HEAD TIP

Fig. 7-4

1. VIDEO HEAD REPLACEMENT
(Refer to Fig. 7-1)

Replace the video head following the procedure described below.

1) Remove the head metal shield.
2) Disconnect the two lead wires from the video head.
3) Remove the video head holding screw.
4) Remove the video head by lifting it with tweezers and then pulling it towards the center of the drum.
5) Hold the new video head being installed with tweezers and insert it into the video head installation plate while taking care to prevent the video tip from touching the drum.
6) Temporarily fix the video head with the holding screw.

2. HEAD TIP PROTRUSION ADJUSTMENT

To accurately perform the video head tip protrusion adjustment, it is necessary to use a video head adjustment microscope. If this microscope is not available, the adjustment can be carried out as follows.

Using a magnifying glass (for example, the VF-300 lens), view the video head block from above as shown in Fig. 7-2 and adjust the video head tip protrusion until $B \fallingdotseq \frac{1}{3}$ A.

For adjustment, loosen the video head retaining screws and adjust by shifting the video head gradually.

NOTE: The tape guide (i.e. A in Fig. 7-2) should be approx. 200μ and the video head tip protrusion approx. 60 to 70μ above the upper edge of the lower drum.

3. VIDEO HEAD HEIGHT ADJUSTMENT

1) Remove the SSG P.C Board (PY-5200) and the case angle which secures the SSG P.C Board.
2) View the video head through the microscope and aligh the transverse axis of the microscope scale with the upper edge of the lower drum.
3) Adjust the microscope until the upper edge of the lower drum is 250μ below the center of the microscope scale as shown in Fig. 7-3.
4) Adjust the head height adjustment screw until the height of the R channel video head (to which red leads are connected) is 250μ as shown in Fig. 7-3. The video head is shown in Fig. 7-4. Be sure to align A with the 250μ level.
5) Turn the video head and adjust the height of the Y channel head (with yellow leads) as in step 4).

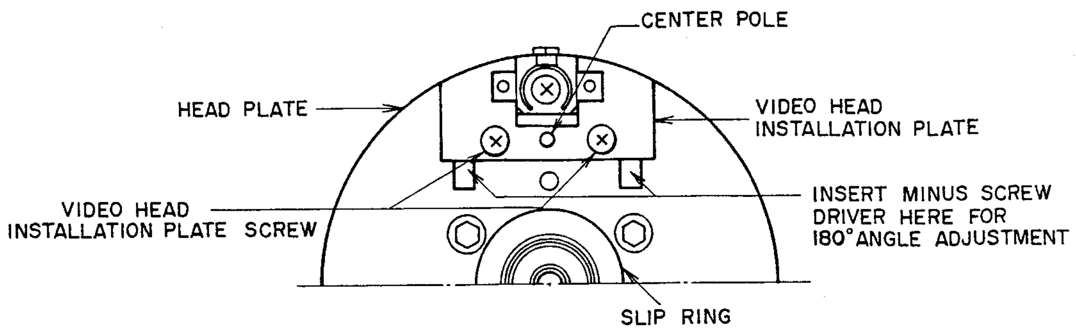

CENTER POLE
HEAD PLATE
VIDEO HEAD INSTALLATION PLATE
VIDEO HEAD INSTALLATION PLATE SCREW
INSERT MINUS SCREW DRIVER HERE FOR 180°ANGLE ADJUSTMENT
SLIP RING

Fig. 7-5

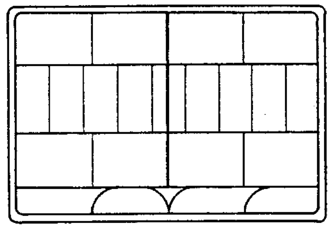


Fig. 7-6

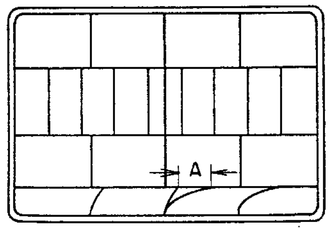


Fig. 7-7

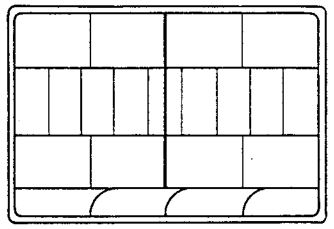


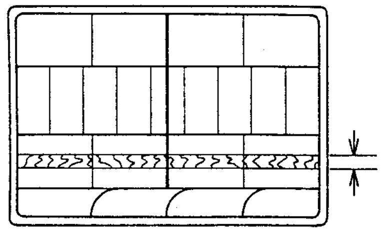
Fig. 7-8

4. 180° ANGLE ADJUSTMENT

If vertical lines at switching points are as shown in Fig. 7-6 and 7-7 when playing back a reference tape, the 180° angle adjustment of the video head is incorrect and readjustment is necessary. Adjust as follows:

1) Loosen the two video head installation plate screws on the Y channel head and tighten them temporarily to 1 kg using a torque screwdriver.
2) Insert a ⊖ screwdriver into the gap under the video head installation plate or the head plate and turn the screwdriver slightly.
3) If the video head angle is modified, playback the reference tape and ascertain that only one vertical line appears at a switching point as shown in Fig. 7-8. If the line is still as shown in Fig. 7-6 or Fig. 7-7, readjust the angle. If portion A in Fig. 7-7 is 1.5 cm on a 1.9-inch monitor TV, no readjustment is required.
4) When the vertical line at a switching point is composed of a single line as in Fig. 7-8 or portion A in Fig. 7-7 is within 1.5 cm, the 180° angle adjustment is displaced incorrectly by 1H if the upper part of the picture sways or the BLK line is 1H too much or too little at the beginning or end of the V BLK on the monitor TV. If this is the case, readjust until the phenomenon is eliminated. After adjustment, tighten the screws to 1.5 kg using a torque screwdriver.

NOTE: On the AKAI cassette VTR reference tape, one frame each is recorded for the right half and the left half of the picture. Therefore, if the 180° angle adjustment is incorrect (Fig. 7-6 and 7-7), there are two vertical lines in the center of the picture but one line each on the right and left. (The right and left halves of the picture are recorded through the Y-channel and R-channel video heads respectively.)



Noise Band view at the Still Mode.
within 3H (About 7.5mm at 19" Monitor TV)

Fig. 7-9

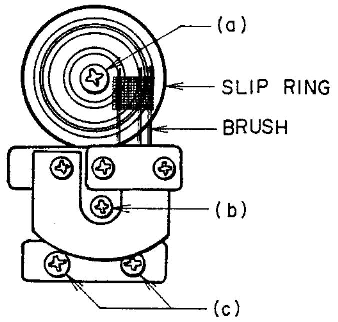


Fig. 7-10

6. SLIP RING AND BRUSH ADJUSTMENT

1) Mount the slip ring using screw (a) in Fig. 7-10 in a position which ensures correct and smooth rotation of the ring.
2) Secure the brush using screw (c) in Fig. 7-10 in such a way that the end of the brush is aligned with the groove in the slip ring.
3) When the end of the brush comes into contact with the slip ring, turn screw (b) by one fourth of a turn.
   This positions the brush correctly.
   However, if brush noise appears on the monitor TV, fine-adjust screw (b).

5. VIDEO HEAD HEIGHT CONFIRMATION

When head height and 180° angle adjustments are complete, confirm the head height as follows.

1) Playback the reference tape in the Still mode and confirm that the noise bandwidth shown in Fig. 7-9 is within 3H (approx 7.5 mm).
2) When the noise bandwidth is over 3H (approx. 7.5 mm), the R-channel and Y-channel video head heights are incorrect. If so, fine-adjust the height of the Y-channel video head, while viewing the screen, until the noise bandwidth is within 3H. However, the noise bandwidth varies slightly according to the tape position. First, find the tape position which permits the widest noise band, and then ascertain that the bandwidth is within 3H.
3) Connect an oscilloscope to TP-5 on the Signal P.C Board (PY-5022) and playback the reference tape so that an RF envelope wave can be seen.
4) Turn on the tracking VR control and turn it gradually to ascertain that the RF envelope wave becomes larger and smaller symmetrically. If the waveform is not symmetrical, the heights of the two video heads are incorrect. If so, readjust the video head height.

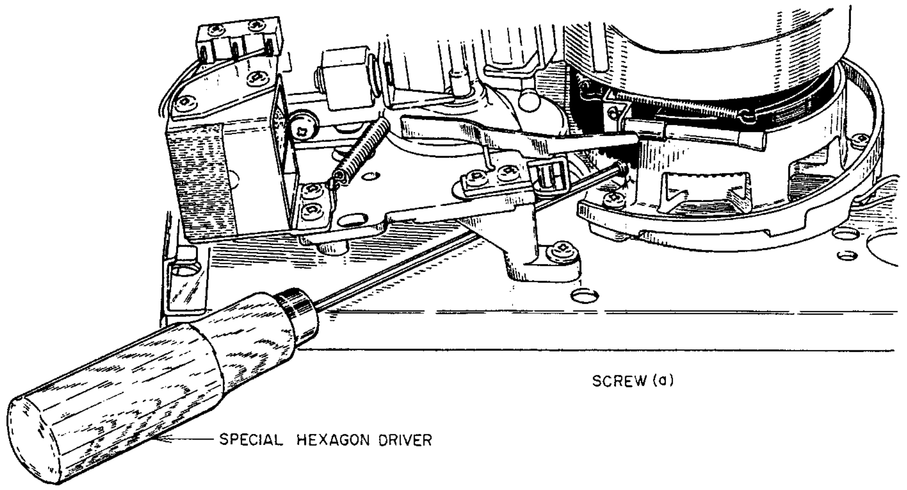


Fig. 7-11

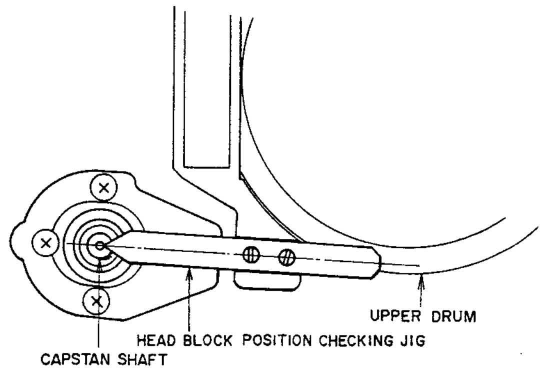


Fig. 7-12

7. VIDEO HEAD BLOCK POSITIONING ADJUSTMENT

If the drum holder is removed from the video head block, positioning adjustment will be necessary. Adjust as follows.

1) Remove the SSG P.C Board from VT-350 together with the case angle.
2) Remove the video head block from the VT-350.
3) Remove the gear motor from the drum holder.
4) Remove two of the three 2 mm hexagon screws retaining the drum holder and tighten screw (a) in Fig. 7-11 provisionally.
5) Install the video head block.
6) Shift the head block by hand until the end of the head-block position checking jig is aligned with the center of the capstan shaft as shown in Fig. 7-12.
7) After they are correctly positioned, tighten screw (a) only tighten by hand using the special hexagon screwdriver shown in Fig. 7-11.
8) Remove the head block again and tighten the three 2 mm hexagon screws on the drum holder using an ordinary hexagonal wrench.
9) Install the head block and ascertain that positioning is correct as shown in Fig. 7-12.

CAUTION: Avoid using the special hexagon screwdriver to remove 2 mm hexagonal screws fixing the drum holder. The special hexagon screwdriver has limited strength. Use it exclusively for tightening screws by hand in step 7).

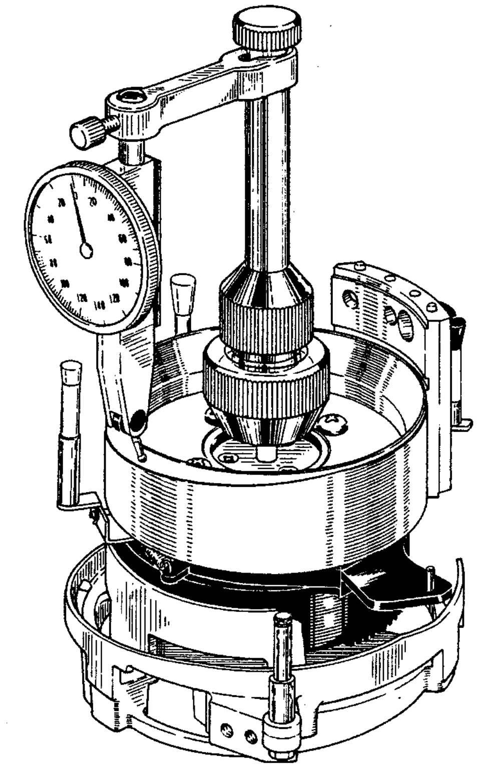


Fig. 7-13

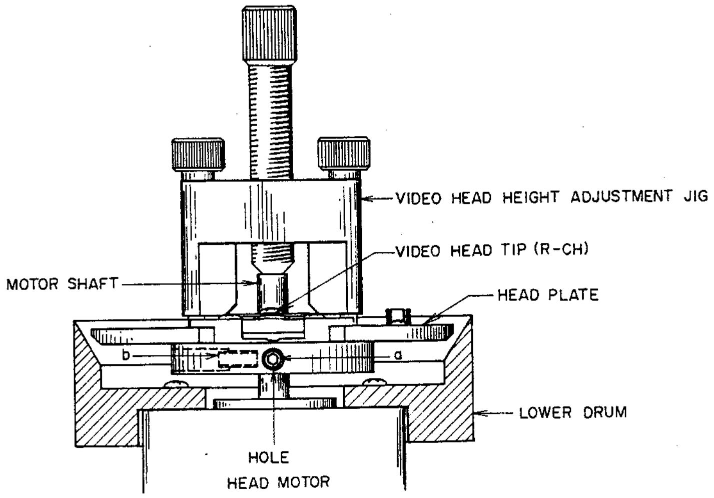


Fig. 7-15

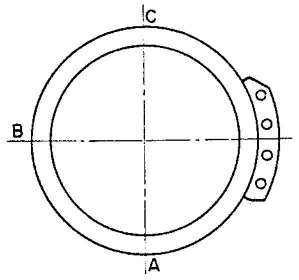


Fig. 7-14

8. DRUM AND HEAD PLATE ADJUSTMENT

1) Lower Drum Adjustment

a) Mount the lower drum on the drum support with its base fitting completely. Check by fitting a razor blade, etc. onto the bottom of the drum support and lower drum. The three screw holes for fixing the drum support have a small play to the right and left. Tighten the screws in the center of each hole.

b) Mount the lower drum on the drum motor and tighten the four screws provisionally.

c) Use a dial gauge, adjust until point B is within $+5\mu/-0$ from points A and C, then secure the lower drum by tightening the four screws inserted in step b).

2) Head Plate Height Adjustment

a) Fit the video head height adjustment jig to the head plate.

b) Mount the head plate on the motor shaft as shown in Fig. 7-15.

c) Using a microscope and the video head height adjustment jig, adjust until the head plate is 500μ above the upper edge of the lower drum.

d) Bring the R-channel video head to the hole in the lower drum.

e) Tighten the 1.5 mm hexagon screw (a) in Fig. 7-15.

f) Tighten another screw (b) (1.5 mm hexagon screw) located on the opposite side of the R-channel head, 90° counterclockwise from the head plate.

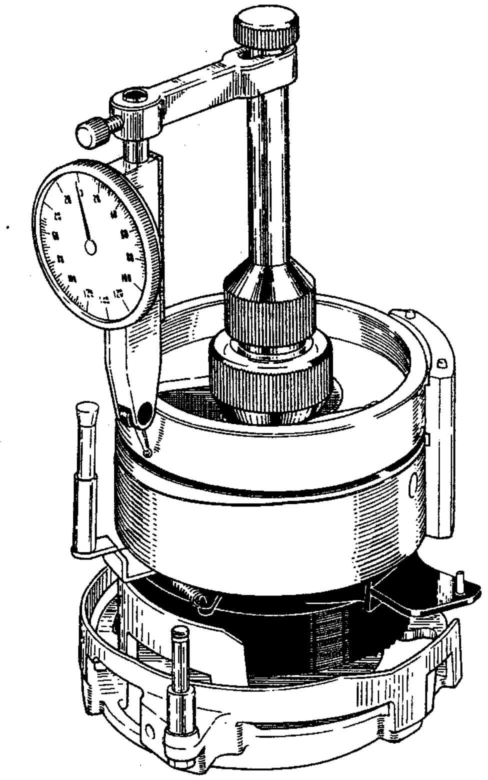


Fig. 7-16

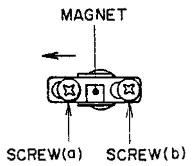


Fig. 7-18

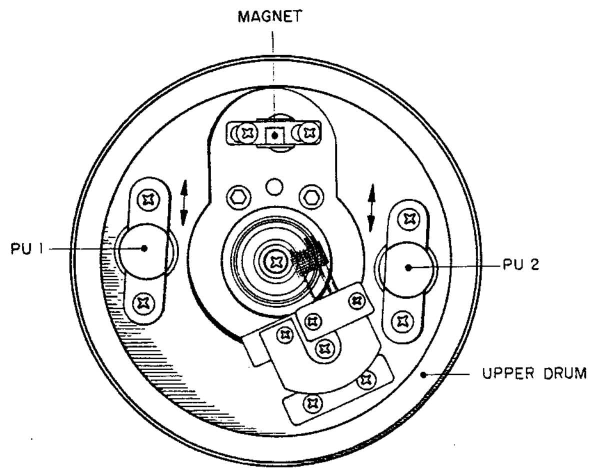


Fig. 7-19

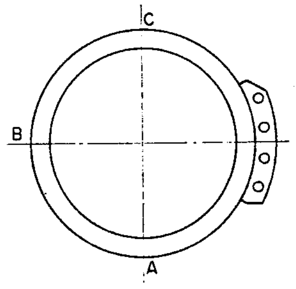


Fig. 7-17

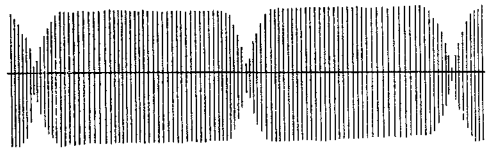


Fig. 7-20

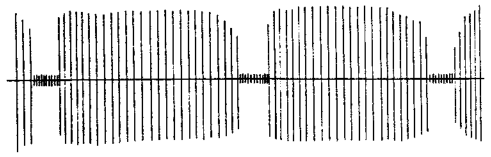


Fig. 7-21

3) Upper Drum Adjustment

a) Mount the upper drum on the drum support. Take great care not to touch the video head. Ascertain that the upper drum runs level with the upper side of the drum support.

b) Ascertain that points A and C are within -15μ $\pm 5\mu$ from point B in Fig. 7-17 and errors at points A and C are within 3μ.

c) If not, adjust the play of the three screws on the upper side of the drum support. If this still fails to obtain the correct relationship between points A, B and C, adjust by inserting a piece of audio tape in the gap between the drum support and the upper drum.

NOTE: The tape width varies according to the type of the tape. Choose a suitable one.

9. MAGNET AND PU HEAD ADJUSTMENT

1) Turn the magnet fully counterclockwise and secure it by tightening screws (a) and (b) as shown in Fig. 7-18 and Fig. 7-19.

2) Connect an oscilloscope to the test point TP-5 on the Signal P.C Board and view the waveform while playing back a reference tape.

3) If the waveform at TP-5 has no signal elements as in Fig. 7-21, adjust the positions of the two PU heads until signal elements are included as in Fig. 7-20.

VIII. MECHANICAL ADJUSTMENT

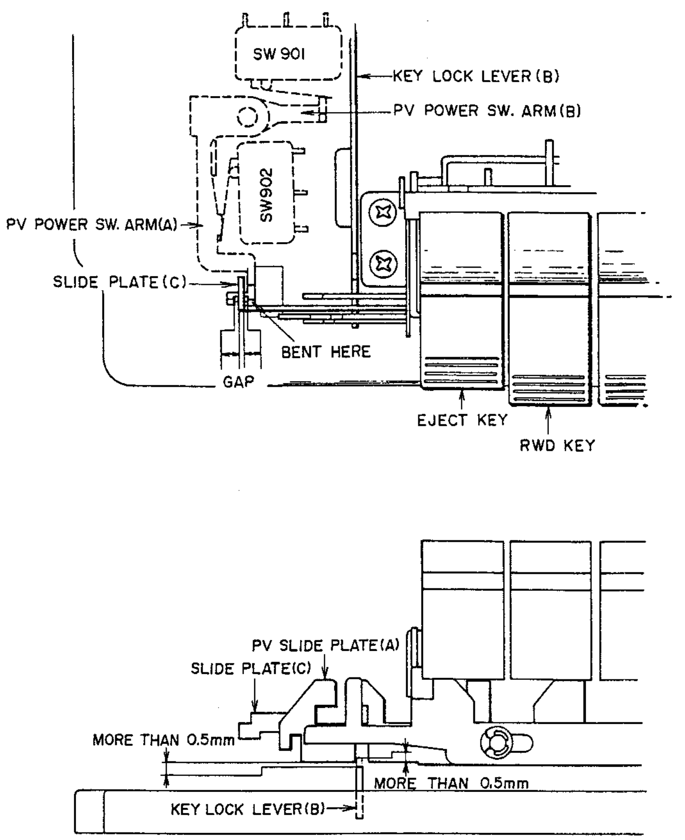

SW901
KEY LOCK LEVER (B)
PV POWER SW. ARM (B)
SW902
PV POWER SW. ARM(A)
SLIDE PLATE (C)
BENT HERE
GAP
EJECT KEY
RWD KEY
PV SLIDE PLATE(A)
SLIDE PLATE(C)
MORE THAN 0.5mm
MORE THAN 0.5mm
KEY LOCK LEVER(B)

Fig. 8-1

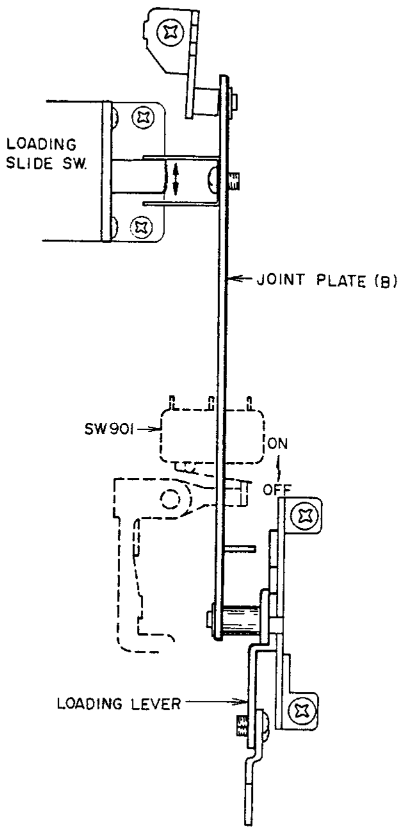

LOADING SLIDE SW.
JOINT PLATE (B)
SW901
ON
OFF
LOADING LEVER

Fig. 8-2

NOTE: For mechanical adjustment, use black plastic tape etc. to prevent light from entering the two CDS shown in the Principal Parts Location.

1. KEY OPERATION ADJUSTMENT

Connect the AC Adaptor VA-300 to the AKAI VTR VT-350 and turn on the VA-300. With no cassette loaded depress each key to ascertain that power cannot be turned on. Then, load a cassette and depress each key to ascertain that power is turned on and each key functions properly. If proper operation is not obtained, adjust as follows.

1) Make sure that both portion (A) of the PV slide plate and portion (B) of the key lock lever are 0.5 mm or more as shown in Fig. 8-1 (b) when a cassette is loaded and unloaded.
2) Make sure that microswitch SW901 shown in Fig. 8-(a) is correctly depressed when a cassette is loaded. (Microswitch SW901 performs the ON/OFF operation of power in the loading mode and slack tape prevention.)
3) Make sure that there is a clearance of approximately 1 mm between PV Power Switch Arm (A) and Slide Plate (C) in the Stop mode as shown in Fig. 8-1 (a). If the clearance is not approx. 1 mm, adjust by slightly bending the PV Power Switch Arm (B) using radio pliers.
4) Make sure that power cannot be turned on by depressing any keys when a cassette is not loaded. (In this case, the keys cannot be depressed but move slightly down.)
5) Make sure that microswitch SW902 shown in Fig. 8-1 (a) is correctly depressed and power is turned on when the recorder is set to the PB mode.
6) Make sure that power cannot be turned off by slightly pushing each key up in the PB, FF, RWD, REC and Sound Dub modes.

2. TAPE LOAD AND UNLOAD MECHANISM ADJUSTMENT

1) Confirmation of Loading Lever Operation (Refer to Fig. 8-2)

a) Make sure that the loading slide switch is fully depressed when the loading lever is moved slowly down. Also make sure of the reverse operation.

b) When the loading lever is moved down and the microswitch is fully depressed by the joint plate (B), make sure that the microswitch cannot be turned off by slightly moving the loading lever up after operating other operation keys.

c) Make sure that the loading lever does not catch the other slide levers shown in Fig. 8-1.

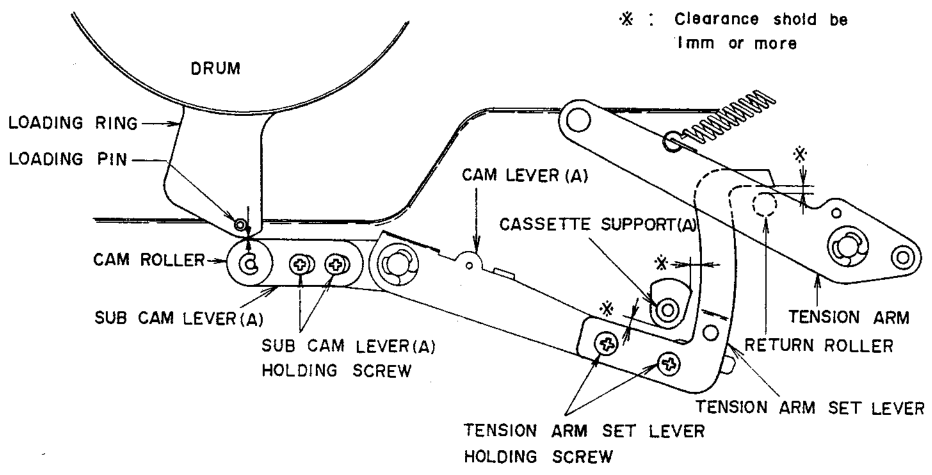

※ : Clearance shold be 1mm or more
DRUM
LOADING RING
LOADING PIN
CAM LEVER (A)
CASSETTE SUPPORT(A)
※
CAM ROLLER
SUB CAM LEVER(A)
SUB CAM LEVER(A) HOLDING SCREW
※
※
TENSION ARM
RETURN ROLLER
TENSION ARM SET LEVER
TENSION ARM SET LEVER HOLDING SCREW

Fig. 8-3

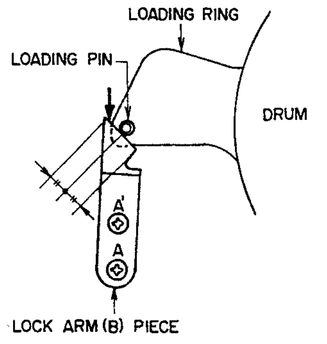

LOADING RING
LOADING PIN
DRUM
A'
A
LOCK ARM (B) PIECE

Fig. 8-4

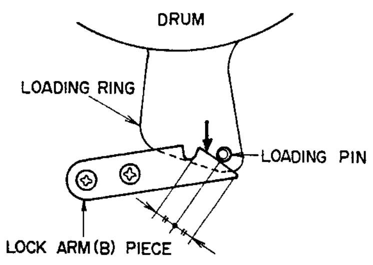

DRUM
LOADING RING
LOADING PIN
LOCK ARM (B) PIECE

Fig. 8-5

2) Sub Cam Lever (A) and Tension Arm Set Lever Adjustment (Refer to Fig. 8-3)

a) The Loading Ring set to Load mode.

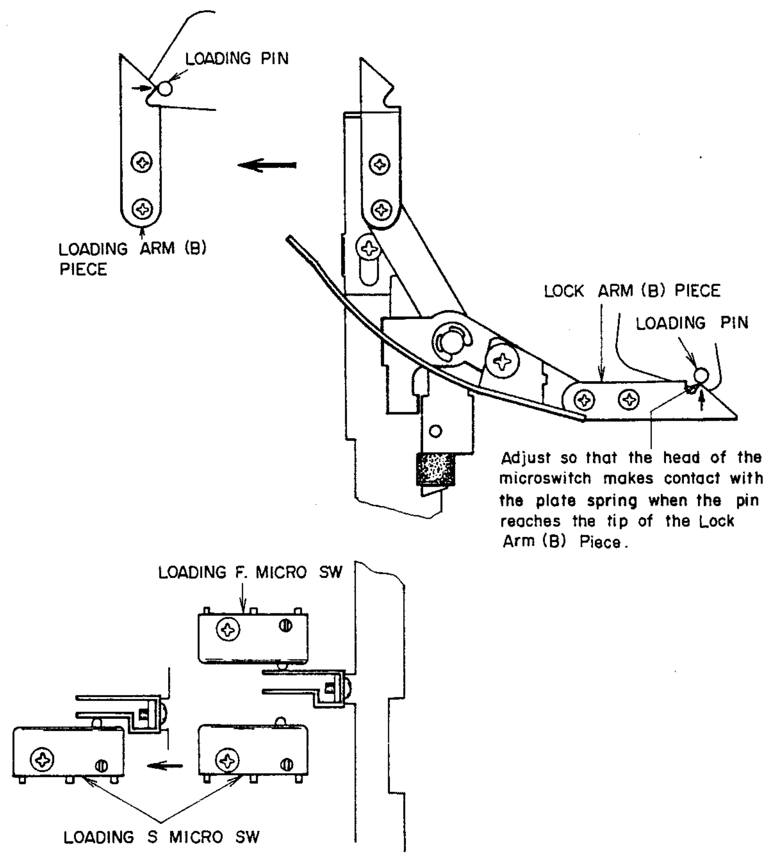
b) Loosen sub cam lever (A) retaining screws and retighten them after adjusting until the end of the loading ring is aligned with the center of the cam roller provided on the sub cam lever (A).

c) Then, make sure that there is a clearance of 1 mm or more between the cam lever (A) and the rubber on the cassette support (A). If the clearance is smaller than 1 mm, loosen the sub cam lever (A) retaining screws again, adjust the angle of the sub cam lever (A) for a clearance of 1 mm or more, then secure the sub cam lever (A) by tightening the sub cam lever (A) retaining screws.

d) Make sure that there is a clearance of 1 mm or more between the return roller and the tension arm set lever and a clearance of 1 mm or more between the tension arm set lever and the rubber. If not, loosen tension arm set lever retaining screws and adjust for a clearance of 1 mm or more.

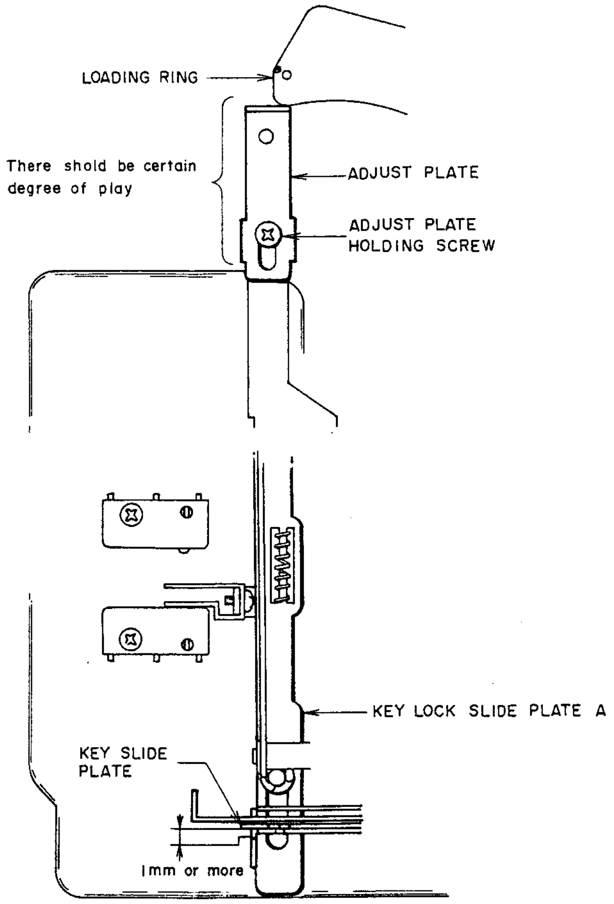
3) Lock Arm (B) Piece Adjustment

Loosen screws (A) and (A') fixing the lock arm (B) piece and adjust until the lock arm piece is positioned as shown by the arrows in Fig. 8-4 (Unload mode) and in Fig. 8-5 (Load mode) at the moment when the loading pin, turned by hand, comes into contact with the lock arm (B) piece.


LOADING PIN
LOADING ARM (B) PIECE
LOCK ARM (B) PIECE
LOADING PIN
LOADING F. MICRO SW
LOADING S MICRO SW

Adjust so that the head of the microswitch makes contact with the plate spring when the pin reaches the tip of the Lock Arm (B) Piece.

Fig. 8-6


LOADING RING
ADJUST PLATE
ADJUST PLATE HOLDING SCREW
KEY LOCK SLIDE PLATE A
KEY SLIDE PLATE
1mm or more

There shold be certain degree of play

Fig. 8-7

4) Loading Finish Microswitch (SW904) Adjustment
Turn the loading ring by hand slightly backward from its position in the loading mode and make the loading pin contact the tip (indicated by the arrow in Fig. 8-6) of the lock arm (B) piece. Then, adjust by shifting the position of the loading finish microswitch or bending the plate spring so that the head of the loading finish microswitch contacts the microswitch plate spring provided on the key lock slide plate.

5) Loading Start Microswitch (SW903) Adjustment
Turn the loading ring by hand slightly from the unloading position and make the loading pin contact the tip (indicated by the arrow in Fig. 8-6) of the lock arm (B) piece. Then adjust by shifting the position of the loading start microswitch or by bending the plate spring.

6) Adjust Plate Adjustment
Tighten the adjust plate retaining screw after positioning the adjust plate in such a way that in the stop mode, there is a clearance of 1 mm or more between the key slide plate and the key lock slide plate and the play between the loading ring and the adjust plate is as shown in Fig. 8-7.

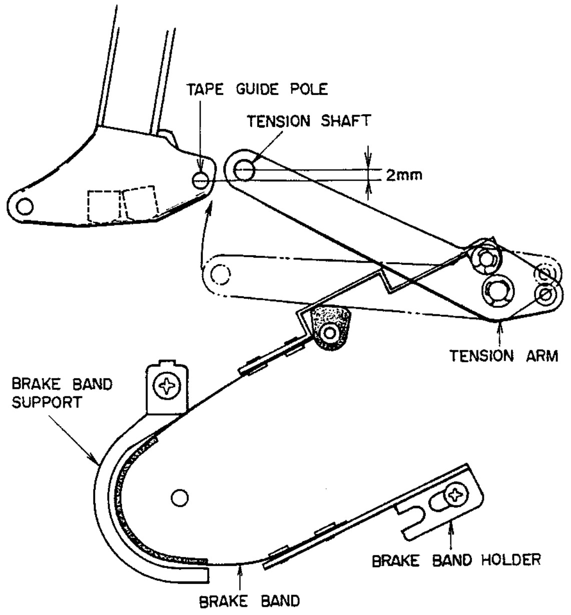
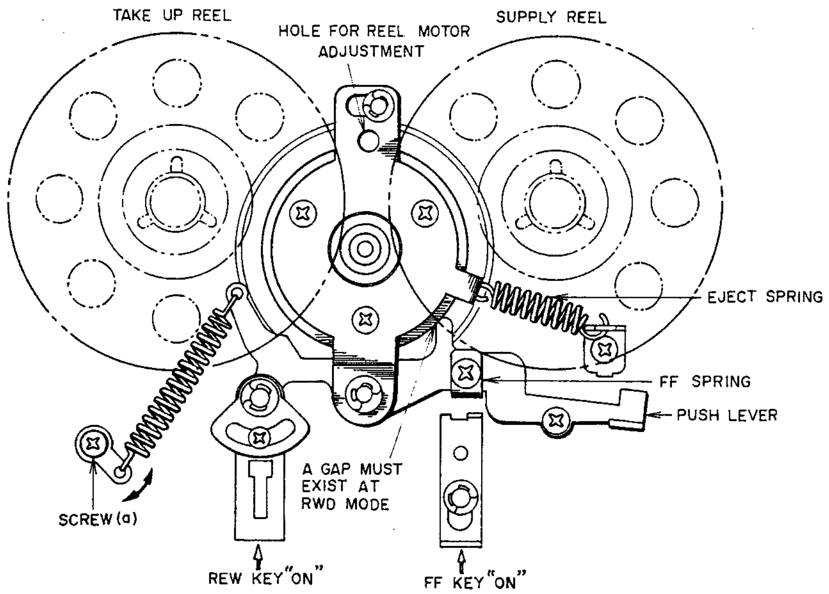

TAPE GUIDE POLE
TENSION SHAFT
2mm
TENSION ARM
BRAKE BAND SUPPORT
BRAKE BAND HOLDER
BRAKE BAND

Fig. 8-8


TAKE UP REEL
HOLE FOR REEL MOTOR ADJUSTMENT
SUPPLY REEL
EJECT SPRING
FF SPRING
PUSH LEVER
SCREW (a)
REW KEY "ON"
FF KEY "ON"

A GAP MUST EXIST AT RWD MODE

Fig. 8-9

7) Tension Shaft Position Adjustment

a) Set the recorder in the play mode at the end of a cassette and make sure that the center of the tension shaft is approximately 2 mm higher than the tape guide pole as shown in Fig. 8-8.
b) If not, adjust the brake band holder.
c) Make sure that the brake band does not contact the supply reel disc and the supply reel can be turned smoothly by hand in the play mode, when the tension shaft is returned by hand to its position in the Stop mode (see the dotted line in Fig. 8-8).

3. TORQUE ADJUSTMENT

NOTE: Torque Gauge is not including the empty reel, so take off one empty reel from old cassette pack (VK-30) and add one shaft to empty reel as Fig. 8-10.

1) Confirmation of RWD Torque (Refer to Fig. 8-9 and Fig. 8-10)

a) Adjust VR-1 on the Power Supply P.C Board in the AC Adaptor VA-300 until an output voltage of 11V is obtained.

b) Stop the supply reel table rotating in Rewind mode by applying sudden pressure with the hand, and varify that there is no slippage between the reel table and the motor pulley, the reel motor stops rotating, and the reel motor resumes rotating promptly when the hand pressure is released from the supply reel table.

* When using a torque gauge, supply a voltage of 11V from the VA-300 to the VT-350 and measure the rewind torque.
The torque should be 350g-cm or more.

2) Confirmation of Fast Forward Torque (Refer to Fig. 8-9 and Fig. 8-10)

a) Adjust VR-1 on the Power Supply P.C Board in the AC Adaptor VA-300 until an output voltage of 11V is obtained.

b) Ascertain that the take-up reel table does not slip on the motor pulley but the reel motor stops rotating when the take-up reel table revolving in the Fast Forward mode is stopped suddenly by hand. Then, confirm that the reel motor speed rises immediately after the reel table is released.

* When using a torque gauge, supply a voltage of 11V from the VA-300 to the VT-350 and measure the fast forward torque. The torque should be 350g-cm or more.

3) Take-up Torque and Reel Motor Pressure Adjustment

a) Adjust VR-1 on the Power Supply P.C Board in the AC Adaptor VA-300 until an output voltage of 11V is obtained.

b) Remove the supply reel table.

c) Set the recorder to the Play mode.

d) Hook a spring gauge in the reel motor pressure adjustment hole as shown in Fig. 8-9, pull the spring gauge in the direction opposite to the take-up reel and loosen screw (a) to adjust the spring until the rotation of the take-up reel stops with a force of 130g ±5g.

e) Fit a torque gauge to the take-up reel as shown in Fig. 8-10 and adjust VR-1 on the Switch P.C Board in Fig. 8-11 until a take-up torque of 80g-cm ±10g-cm is obtained.

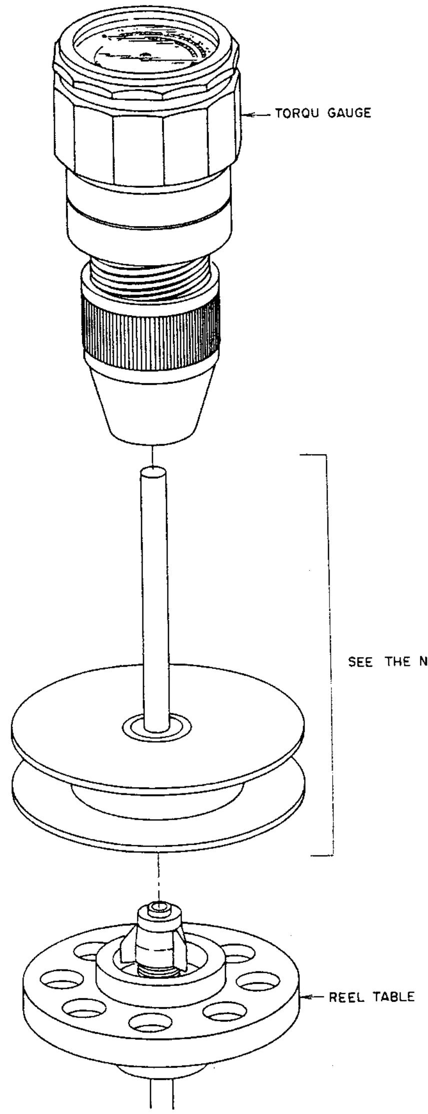


Fig. 8-10

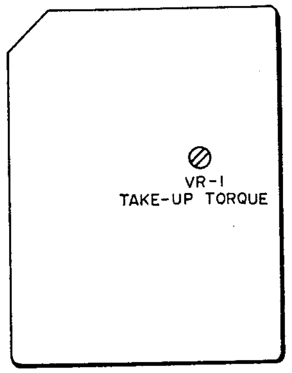


Fig. 8-11 Switch P.C Board (PY-5202)
(Pattern side view)

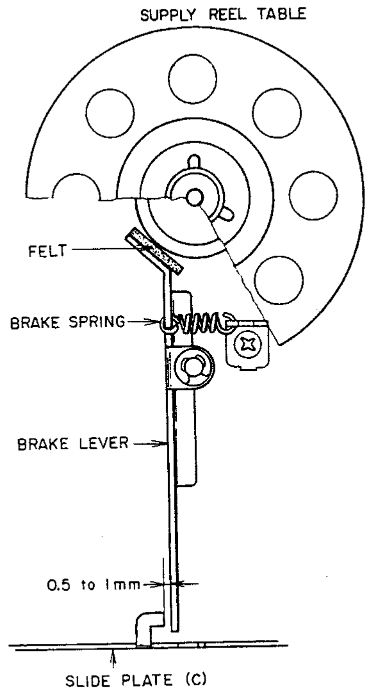


Fig. 8-12

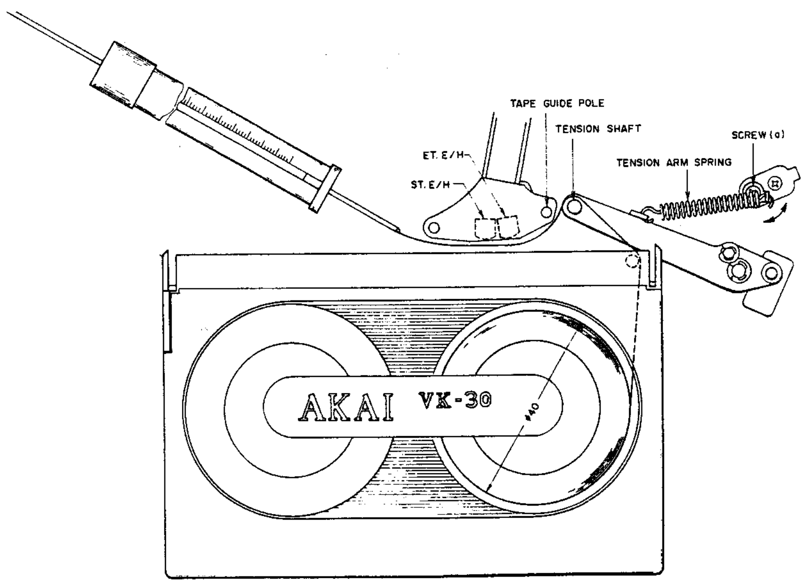


Fig. 8-13

4) Confirmation of Brake Torque

a) Fit a torque gauge to the supply reel table and make sure that a torque of 30g-cm or more is obtained when the supply reel table is rotated counterclockwise.

b) Confirm that there is a clearance of 0.5 mm to 1 mm between the brake lever and slide plate in the Stop mode as shown in Fig. 8-12.

5) Back Tension Adjustment

a) Modify the VK-30 to obtain the jig shown in Fig. 8-13.

b) Turn on the Play Key, loosen screw (a) and adjust the spring until the spring gauge, pulled at virtually the same speed as the tape speed during playback, indicates 25g to 30g.

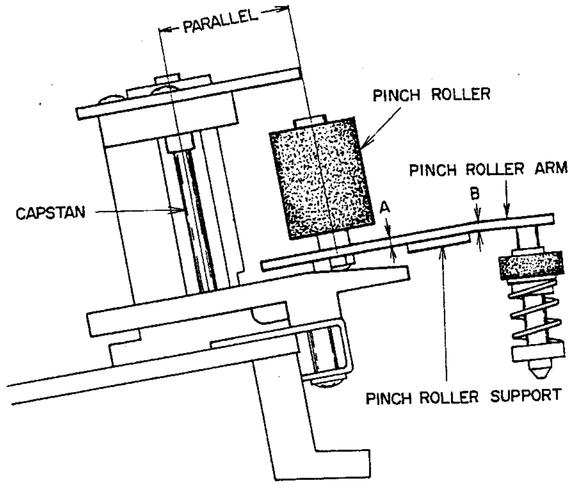

PARALLEL
PINCH ROLLER
PINCH ROLLER ARM (B)
CAPSTAN
A
B
PINCH ROLLER SUPPORT

Fig. 8-14

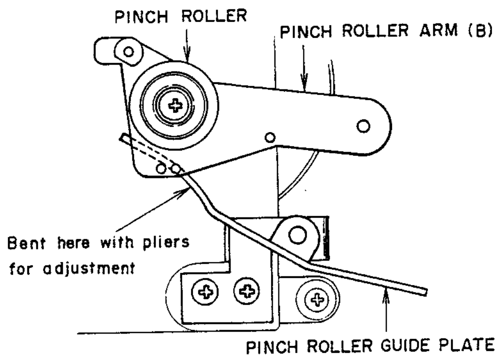

PINCH ROLLER
PINCH ROLLER ARM (B)
Bent here with pliers for adjustment
PINCH ROLLER GUIDE PLATE

Fig. 8-15

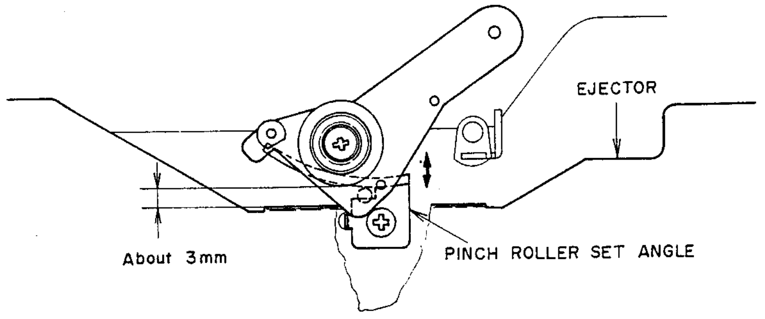

EJECTOR
About 3mm
PINCH ROLLER SET ANGLE

Fig. 8-16

4. PINCH ROLLER ADJUSTMENT

1) Pinch Roller Alignment Adjustment

Confirm that the pinch roller runs parallel with the capstan shaft in the Load mode. If they are not parallel with each other, adjust by bending portion A in Fig. 8-14 while taking care not to exert force on portion B. Also, take care not to damage the pinch roller support.

2) Pinch Roller Position Adjustment

a) During the Load Mode

Adjust by bending the pinch roller guide plate shown Fig. 8-15 until there is a clearance of 1 mm to 2 mm between the pinch roller and the capstan shaft in the load mode.

b) During the Stop Mode

Bend the pinch roller set angle back and forth as indicated by the arrows in Fig. 8-16 and determine the position of the pinch roller in the Stop mode. If the pinch roller protrudes too much, the tape is caught by the roller when loading a cassette. If the pinch roller is positioned too far back, it interferes with the ejector when it pops up. Adjust until a clearance of approximately 3 mm is obtained as shown in Fig. 8-15.

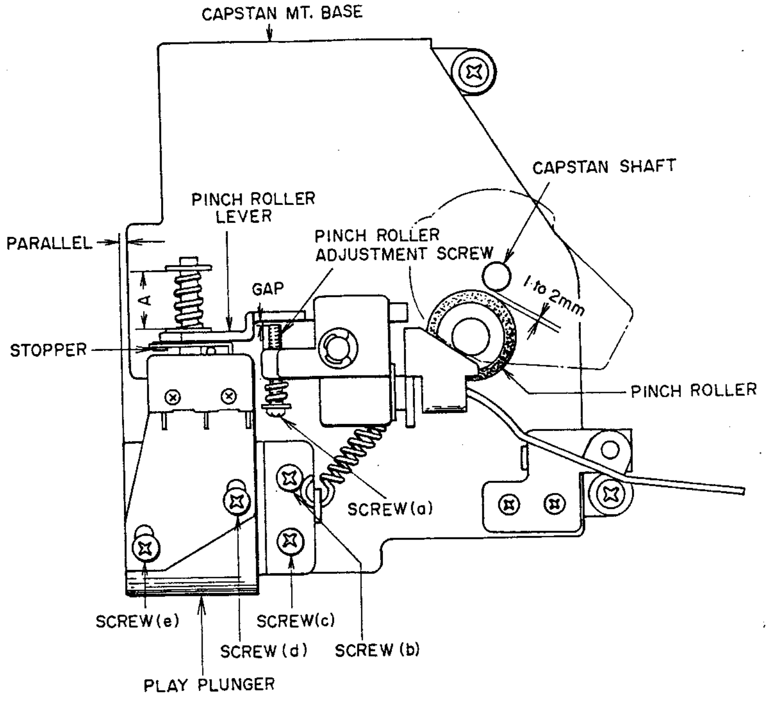

CAPSTAN MT. BASE
CAPSTAN SHAFT
PINCH ROLLER LEVER
PINCH ROLLER ADJUSTMENT SCREW
PARALLEL
A
GAP
1 to 2mm
STOPPER
PINCH ROLLER
SCREW(a)
SCREW(e)
SCREW(c)
SCREW(d)
SCREW(b)
PLAY PLUNGER

Fig. 8-17

5. PLAY PLUNGER ADJUSTMENT (Refer to Fig. 8-17)

1) Adjust VR-1 on the Power Supply P.C Board in the AC Adaptor VA-300 until an output voltage of 10.5V is obtained.
2) Adjust screw (b) and (c) until the play plunger runs parallel with the capstan mounting base.
3) Adjust screw (a) so that clearance (a) is 10.8 mm in the Play mode.
4) Adjust screws (d) and (e) to position the two microswitches in such a way that they are pushed by the pinch roller lever when the plunger is pulled.
5) Confirm that there is a clearance between the pinch roller lever and the stopper when the plunger is pulled. If there is not, bend the stopper slightly to provide a clearance.
6) Confirm that the pinch roller lever has some play and that the clearance between the pinch roller and the capstan shaft is 1 mm to 2 mm when the stop key is depressed in the Load mode.

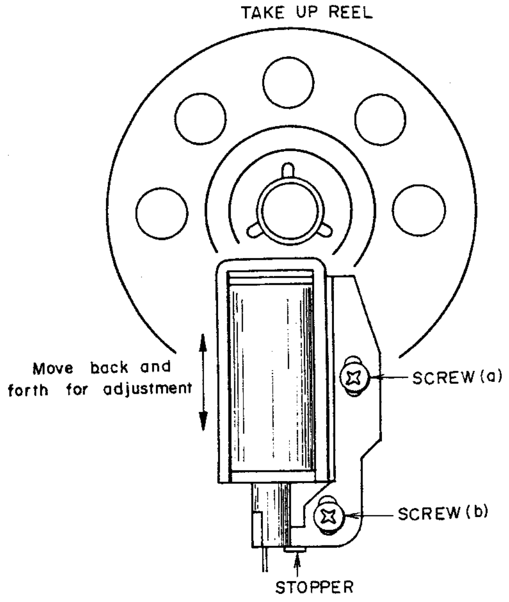

TAKE UP REEL
Move back and forth for adjustment
SCREW(a)
SCREW(b)
STOPPER

Fig. 8-18

6. RELEASE PLUNGER ADJUSTMENT (Refer to Fig. 8-18)

1) Adjust VR-1 on the Power P.C Board in the AC Adaptor VA-300 until an output voltage of 10.5V is obtained.
2) Depress the Play Key and adjust screws (a) and (b) to position the release plunger in such a way that the play key is smoothly released just before fully pushing the release plunger shaft into the plunger solenoid by hand.
3) Confirm that operation keys can be released smoothly when the maximum load is applied to the release plunger (i.e. during the REC and Sound Dub. modes). If operation keys cannot be released, loosen screws (a) and (b) again and adjust the release plunger's position.
4) Operate each key repeatedly and ascertain that the release plunger functions properly.

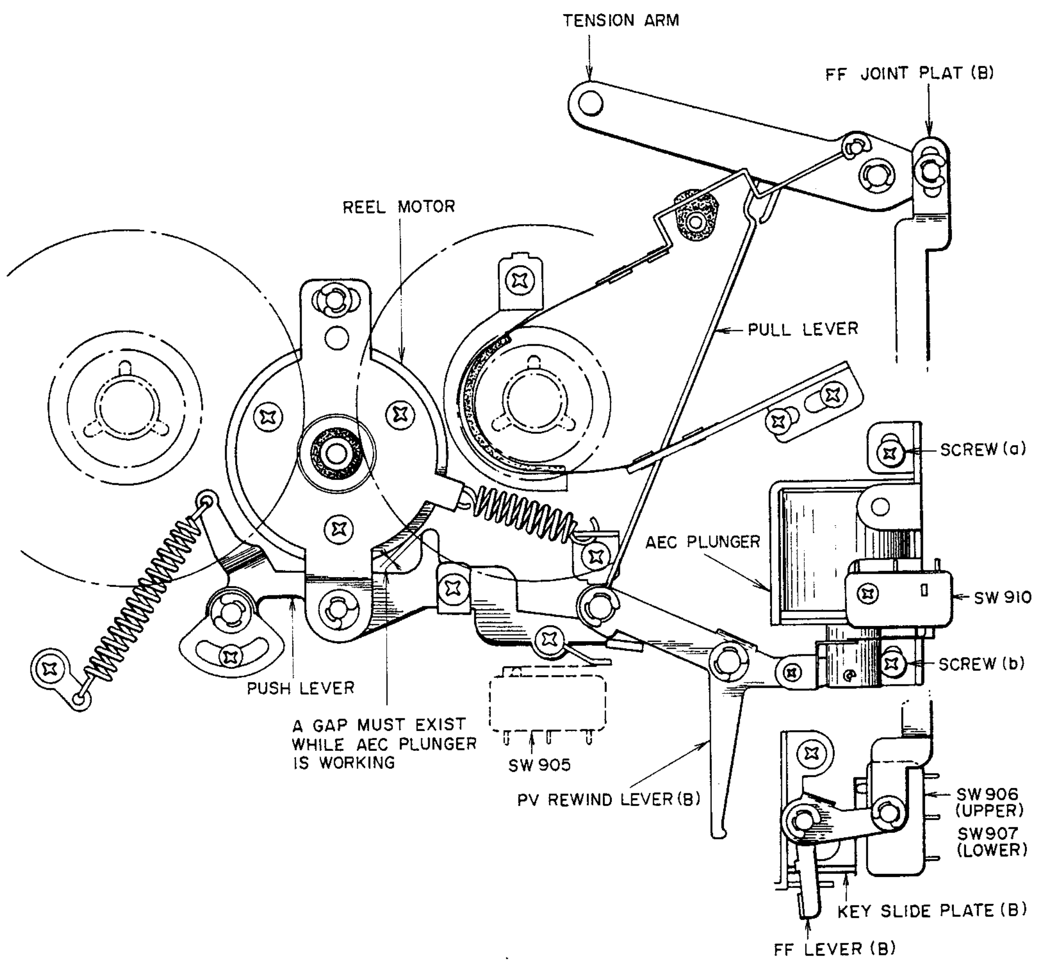

TENSION ARM
FF JOINT PLAT (B)
REEL MOTOR
PULL LEVER
SCREW (a)
AEC PLUNGER
SW 910
SCREW (b)
PUSH LEVER
A GAP MUST EXIST WHILE AEC PLUNGER IS WORKING
SW 905
PV REWIND LEVER (B)
SW906 (UPPER)
SW907 (LOWER)
KEY SLIDE PLATE (B)
FF LEVER (B)

Fig. 8-19

7. AEC MECHANISM ADJUSTMENT (Refer to Fig. 8-19)

1) Adjust VR-1 on the Power Supply P.C Board in the AC Adaptor VA-300 until an output voltage of 10.5V is obtained.
2) Secure the AEC plunger with screws (a) and (b) in such a way that the AEC plunger is biased to the tension arm as far as possible.
3) Make sure that the push lever is 0.3 mm to 0.5 mm away from the reel motor when the AEC plunger operates.
4) Make sure that microswitches SW905, SW906, SW907 and SW910 are depressed when the AEC plunger operates.
5) Make sure that the AEC Rewind functions smoothly when the stop key is depressed in the playback, Sound Dub or Recording mode or when the TV camera switch is operated in the Recording mode.

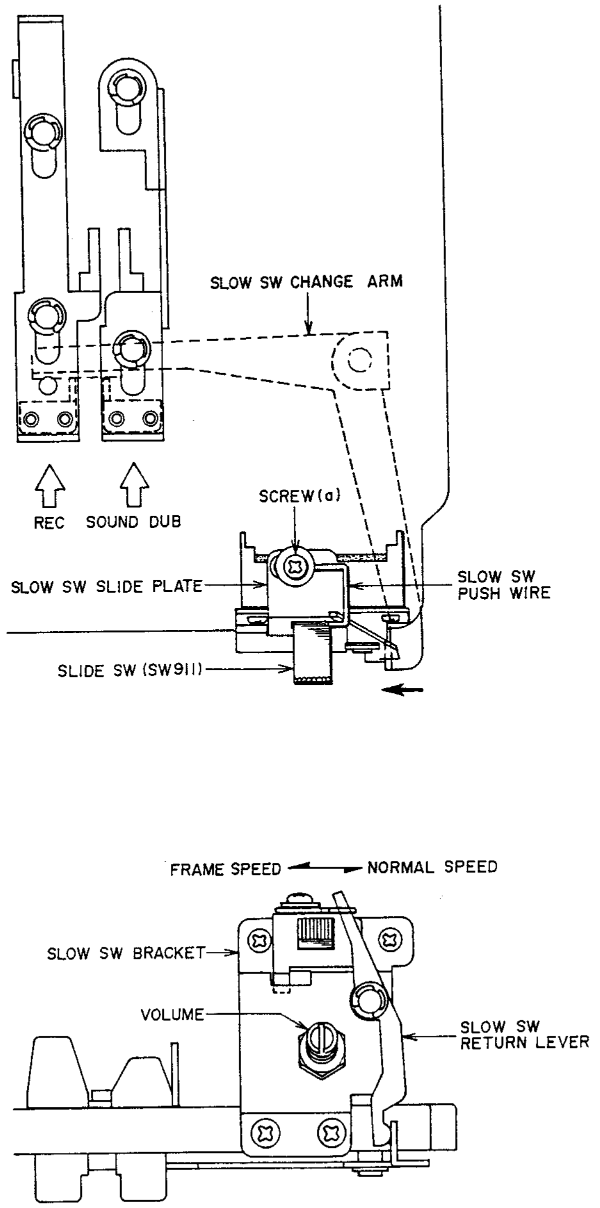

SLOW SW CHANGE ARM
SCREW (a)
REC
SOUND DUB
SLOW SW SLIDE PLATE
SLOW SW PUSH WIRE
SLIDE SW (SW911)
FRAME SPEED
NORMAL SPEED
SLOW SW BRACKET
VOLUME
SLOW SW RETURN LEVER

Fig. 8-20

8. SPEED SWITCH (SW911) ADJUSTMENT (Refer to Fig. 8-20)

1) Set the slide switch (SW911) to the Frame Speed position and secure the slow switch push wire with the screw (a) in such a way that the slide switch is set to the Normal position when the Rec. key is depressed.
2) Set the slide switch to the Frame Speed position and make sure that the slide switch is set to the Normal position when the Sound Dub. key is depressed.

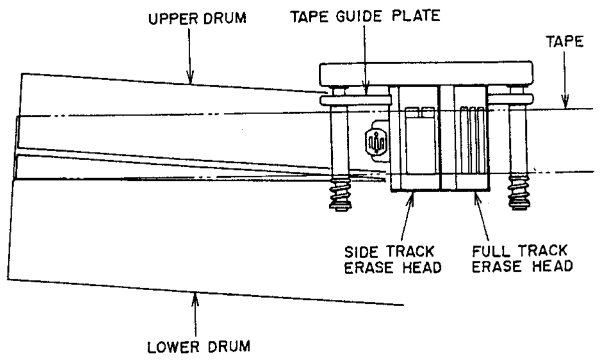


Fig. 8-21

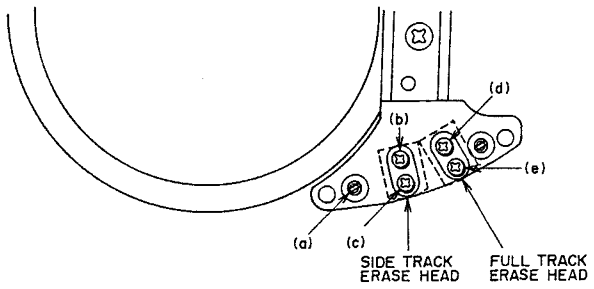


Fig. 8-22

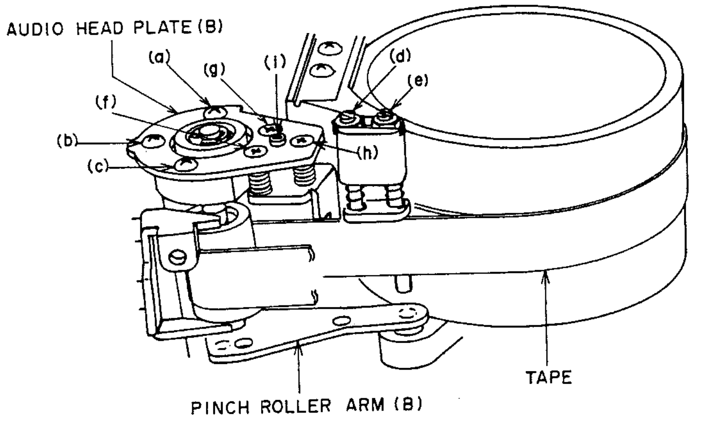


Fig. 8-23

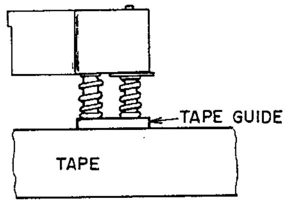


Fig. 8-24

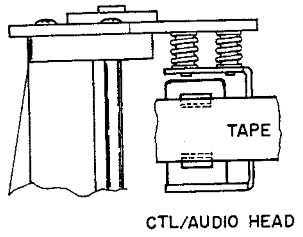


Fig. 8-25

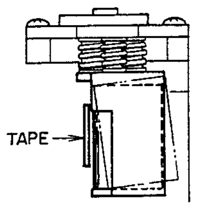


Fig. 8-26

9. TAPE TRANSPORTATION ADJUSTMENT

1) **Tape Entrance Adjustment**
   (Refer to Fig. 8-21 and 8-22)
   a) Confirm that the tape travels on the lower edges of the full track erase and side track heads and is smoothly transported on the tape guide on the lower drum.
   If it is not, loosen screws (a) and (f) to adjust the tape guide plate to the correct tape height.
   b) After screws (a) and (f) are correctly adjusted, operate the recorder for recording and sound dubbing and ascertain that the tape is correctly erased.

2) **Tape Exit Adjustment**
   a) Loosen screws (f), (g) and (h) shown in Fig. 8-23 and remove the CTL/Audio heads from the tape transport path to avoid their making contact with the tape.
   b) Adjust screws (d) and (e) shown in Fig. 8-22 so that the tape does not contact the tape guide.
   c) Put the tape in motion in the Playback mode.
   d) Confirm that the tape does not undulate when it is forwarded between the pinch roller and the capstan. If the tape undulates, adjust the pinch roller.
   e) Adjust screws (f), (g), (h) and (i) in Fig. 8-23 so that the height and angle of Audio/CTL heads are almost as shown in Fig. 8-25 and Fig. 8-26.
   f) Adjust screws (d) and (e) in Fig. 8-23 and adjust the height of the tape guide so that the tape guide runs parallel with the tape and just touches the upper edge of the tape.
   g) Connect an oscilloscope to TP-5 on the Signal P.C Board (PY-5022), playback a reference tape and fine-adjust screws (f), (g) and (h) in Fig. 8-23 until the RF envelope is maximum.
   h) Connect an oscilloscope to P5 ③ (Audio Out) on the Signal P.C Board (PY-5022), playback a reference tape (7 kHz) and fine-adjust screws (f), (g) and (h) in Fig. 8-23 until the maximum output is obtained at Audio Out. After the adjustment is completed, reconfirm the RF envelope at TP-5 on the Signal P.C Board (PY-5022).

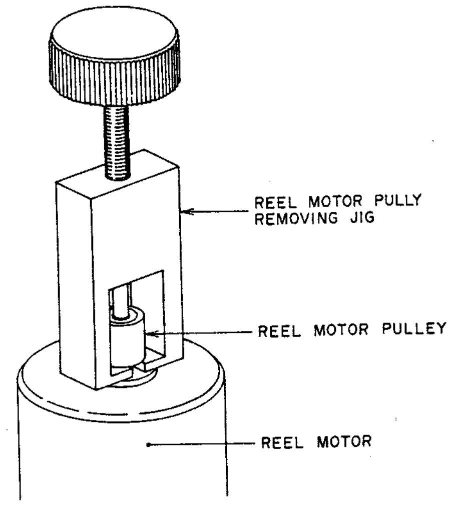


Fig. 8-27

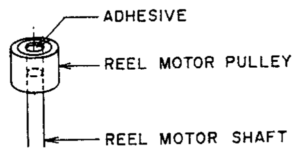


Fig. 8-28

10. HOW TO REPLACE REEL MOTOR PULLEY

The reel motor pulley of the VT-350 is fixed on the motor shaft with adhesive and, if the motor pulley is pulled out forcibly, the motor shaft may be bent. Be sure to use the reel motor pulley removing jig shown in Fig. 8-27 when removing the pulley.

1) Remove the outer cover, cassette receptacle and both left and right reels from VT-350, set the jig as shown in Fig. 8-27 (At this time, make sure that the center of the jig and that of the motor shaft are aligned correctly.), then slowly turn the Knob (on the top of the jig) clockwise until the motor pulley is removed.
2) When the motor pulley is removed, scrape off the adhesive remaining on the motor shaft using a razor blade or a similar implement. (At this time, make sure that no piece of scraped adhesive is allowed to fall into the inside of the motor.)
3) Fit the new motor pulley on the motor shaft and screw it until end of reel motor shaft reaches nearly half the distance of the motor pulley hole. (Fig. 8-28) Then, put a small quantity of adhesive in the motor pulley hole and screw the motor pulley further until the end of shaft reaches the proper position. Now, let the adhesive dry.

CAUTION

1) Avoid use of thinners, etc., to remove the hardened adhesive after the motor pulley has been taken out. In addition, do no apply any adhesive on the motor shaft before fitting the motor pulley on the motor shaft, because the thinners or adhesive may drop into the motor, leading to seizure (overheating) of the motor when it is operated. Be especially careful about this matter.
2) The adhesive to be used should be Three Bond 5H or Lock Tight 601. Other adhesives are not recommended, because they may crack when they are dried.

IX. ELECTRICAL ADJUSTMENT

1. SERVO P.C BOARD (PY-5203) ADJUSTMENTS

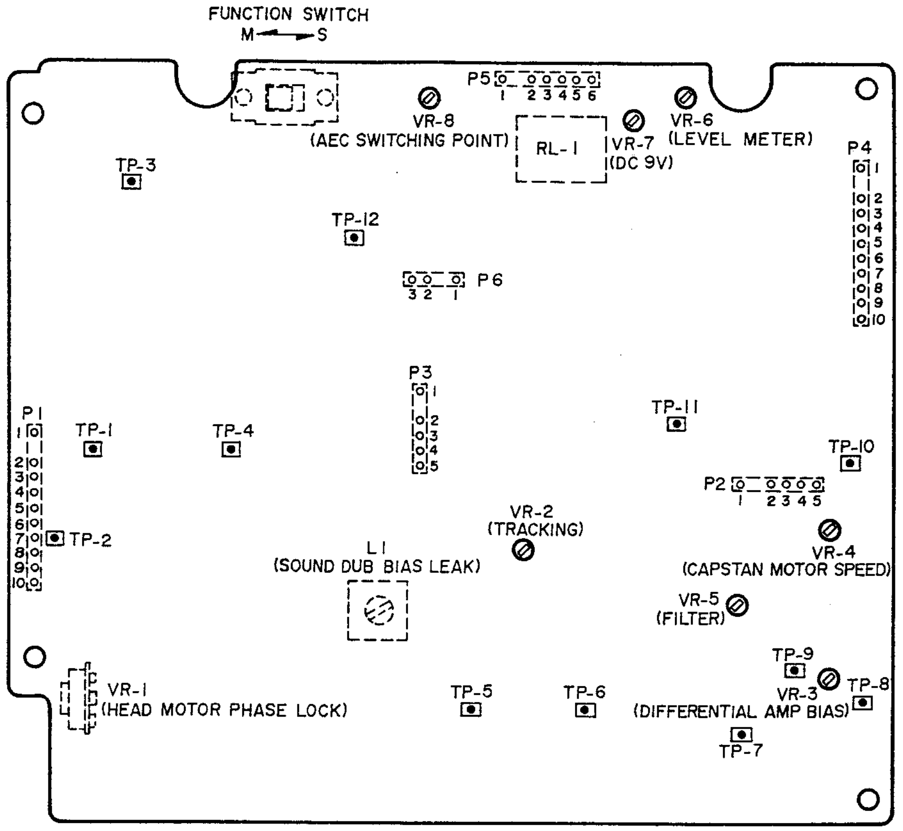
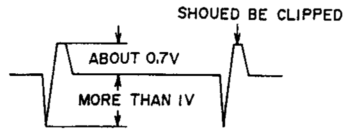
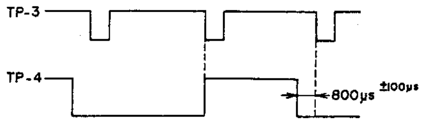
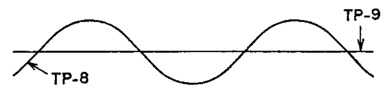
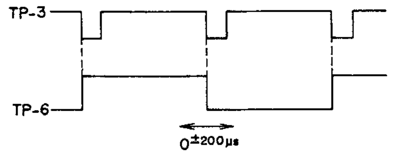
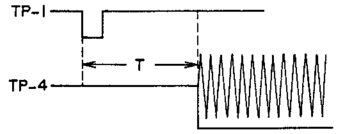

FUNCTION SWITCH
M S
P5
1 2 3 4 5 6
VR-8
(AEC SWITCHING POINT)
RL-1
VR-7
(DC 9V)
VR-6
(LEVEL METER)
P4
1 2 3 4 5 6 7 8 9 10
TP-3
TP-12
P6
3 2 1
P3
1 2 3 4 5
P1
1 2 3 4 5 6 7 8 9 10
TP-1
TP-4
TP-2
TP-11
TP-10
P2
1 2 3 4 5
VR-2
(TRACKING)
L1
(SOUND DUB BIAS LEAK)
VR-4
(CAPSTAN MOTOR SPEED)
VR-5
(FILTER)
TP-9
VR-3
(DIFFERENTIAL AMP BIAS)
TP-8
VR-1
(HEAD MOTOR PHASE LOCK)
TP-5
TP-6
TP-7

Fig. 9-1 Servo P.C Board (PY-5203) (Pattern side view)

* Set to Function Switch to "s" position.

Step	Adjustment Item	Test Point	Adjustment Parts	Mode	Result
1	DC12V	P4 ⑥	VR1 (300B) of VA-300	E-E	DC12V ±0.02V
2	Battery Checker	TP-12	VR7 500B	E-E	DC10V ±0.1V
		Level Meter	VR6 500B		Meter needle Points to a Position between red and white zone.
3	DC9V	TP-12	VR7 500B		DC9V ±0.1V
4	PU Head Output	TP-1 TP-2	Confirmation	E-E	 SHOUED BE CLIPPED ABOUT 0.7V MORE THAN 1V Fig. 9-2
5	Head Motor Phase Lock	TP-3 TP-4	VR1 2 kB	E-E	 TP-3 TP-4 800μs ±100μs (NOTE 1) Fig. 9-3
6	Differential Amp Bias	TP-8 TP-9	VR3 200B	PB (Reference Tape)	 Fig. 9-4 Adjust the DC voltage of TP-9 to the center of TP-8 wave.
7	Filter	TP-11	VR5 10 kB	PB (Reference Tape)	Make the flat waveform as nera to DC as possible and obtain the minimum voltage possible.
8	Capstan Motor Speed	TP-10	VR4 20 kB	E-E	Connect Frequency Counter to TP-10. US: about 866 Hz CCIR: about 848 Hz (NOTE 2)
9	Tracking	TP-3 TP-6	VR2 50 kB	PB (Reference Tape)	 TP-3 TP-6 0±200μs Fig. 9-5
10	Sound Dub Bias Leak	TP-5	L1 22 mH	Sound Dub	Adjust Bias leak to minimum.
11	AEC Switching Point	TP-1 (PY-5203) TP-4 (PY-5022)	VR8	E-E Rec	 Fig. 9-6 T: 15.5 ms ±0.5 ms (US) T: 19.0 ms ±0.5 ms (CCIR) (NOTE 3)

NOTES:

1. For the last stage of this adjustment, adjust VR-1 (2 kB) until the switching point is 7.5H from the V sync.
2. This is an electrical speed adjustment. Finally, set the Function Switch to "M", playback a US 1,000 Hz standard tape and adjust VR4 (20 kB) until the output is within 993 to 1,003 Hz (US) and 977 to 986 Hz (CCIR).
3. The recording current increases only once after the recording power is turned on. If the increase is to be checked again, turn off the power, then turn it on again. The increase waveform can be seen only once on the oscilloscope at the moment when the recording starts in the E-E mode.

2. SIGNAL P.C BOARD (PY-5022) ADJUSTMENTS

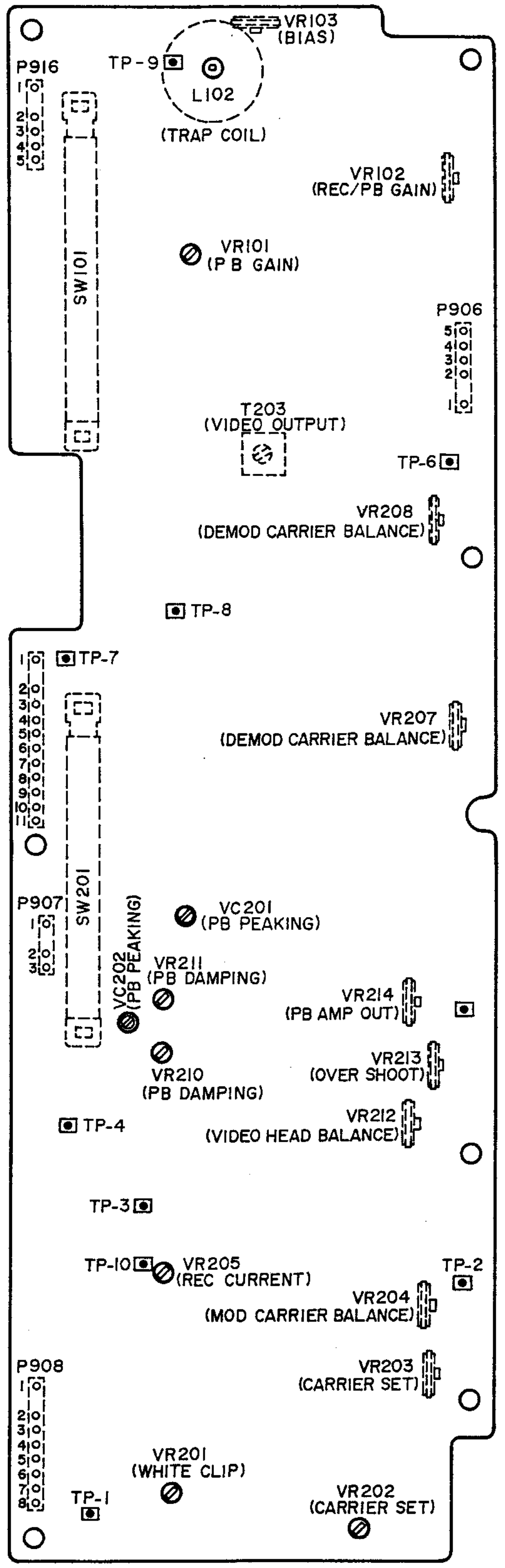
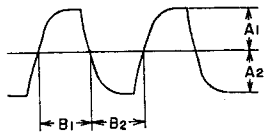
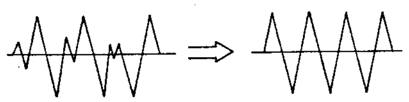
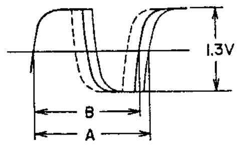
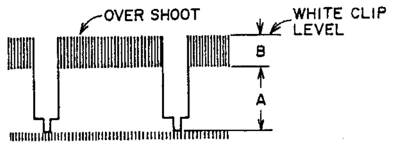
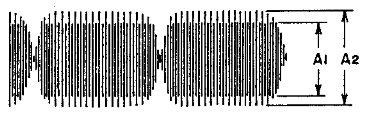

VR103
(BIAS)
P916
TP-9
L102
(TRAP COIL)
VR102
(REC/PB GAIN)
VR101
(P B GAIN)
SW101
P906
T203
(VIDEO OUTPUT)
TP-6
VR208
(DEMOD CARRIER BALANCE)
TP-8
TP-7
VR207
(DEMOD CARRIER BALANCE)
SW201
P907
VC201
(PB PEAKING)
VC202
(PB PEAKING)
VR211
(PB DAMPING)
VR214
(PB AMP OUT)
VR213
(OVER SHOOT)
VR210
(PB DAMPING)
VR212
(VIDEO HEAD BALANCE)
TP-4
TP-3
TP-10
VR205
(REC CURRENT)
TP-2
VR204
(MOD CARRIER BALANCE)
P908
VR203
(CARRIER SET)
VR201
(WHITE CLIP)
TP-1
VR202
(CARRIER SET)

Fig. 9-7 Signal P.C Board (PY-5022) (Pattern side view)

1) Video Section Adjustments

Step	Adjustment Item	Test Point	Adjustment Parts	Mode	Result
1	Carrier Balance	TP-3	VR204 500B	E-E	 Fig. 9-8
		TP-8	VR207 30 kB VR208 100B	E-E	 Fig. 9-9
2	Carrier Set (NOTE 1)	TP-3	VR201 5 kB	E-E (Supply a Video Signal NOTE 2)	Fully counter clockwise (Viewed from the pattern side)
			VR203 1 kB VR202 1 kB		 Fig. 9-10
3	White Clip	TP-2	VR201 5 kB	E-E (Supply a Video Signal NOTE 2)	 OVER SHOOT WHITE CLIP LEVEL B A Fig. 9-11
4					Adjust by repeating steps 1, 2 and 3.
5	Video Output	TP-7	T203 17K415	E-E (Supply a Video Signal NOTE 2)	Video output signal 1Vp-p.
6	PB Peaking	TP-5	VR210 50 kB VR211 50 kB VR213 500B		Fully clockwise (Viewed from the Pattern side)
			VR212 1 kB VR214 1 kB		Center position.
			VC201 20P VC202 20P		 RF Envelope amplitude is maximum and also the error between A1 (Part at which brightness is intense) and A2 (Part at which brightness is faint) is as small as possible. Fig. 9-12

Step	Adjustment Item	Test Point	Adjustment Parts	Mode	Result
7	PB Damping	TP-5	VR210 50 kB VR211 50 kB	PB (Reference Tape)	Set to a position just before RF Envelope level begins to drop.
8	Video Head Balance	TP-5	VR212 1 kB	Rec/PB (Supply a Video Signal. NOTE 2)	Equalize the outputs of R-ch Video Head and Y-ch Video Head.
9	Over Shoot	Picture	VR213 500B	Rec/PB (Supply a Video Signal. NOTE 2)	Watch the picture image and set the VR213 to the optimum position. (NOTE 3)
10	PB Amp Out	TP-5	VR214 1 kB	PB (Reference Tape)	RF Envelope is 0.2Vp-p.
11	Rec Current	TP-4 TP-5	VR205 1 kB	Rec/PB (Supply a Video Signal. NOTE 2)	Video Signal is maximum level at playback (TP-5). Voltage is about 2.5 3.3Vp-p at Rec mode (TP-4). (NOTE 4)
12	Chroma Trap	TP-1	T1 (on PY-5003)	Rec (Note 5)	Chroma Level at TP-1 is reduced to minimum.

NOTES:

1. The carrier setting can also be performed by the following procedure.
    1) Connect an oscilloscope to TP-2 and a frequency counter to TP-3.
    2) With a non-signal input applied in the E-E mode, adjust VR203 until the frequency counter indicates 3.1 MHz ±100 kHz.
    3) Connect a DC constant voltage power source to TP-2, increase the voltage gradually and read the voltage A(V) at TP-2 through the oscilloscope in the DC mode when the frequency counter connected to TP-3 indicates 4.5 MHz ±100 kHz.
    4) Apply a color bar input (100% white) to TP-1, examine the voltage at TP-2 with the oscilloscope in the DC mode and adjust VR202 until A volts are present.
    * A is approximately 3.3V.
2. Video signal is supplied from a camera (VC-300, etc.) or Mono Scope with video output of 1Vp-p.
3. Since the overshoot adjustment is not ordinarily necessary, set VR213 to the fully clockwise position. However, in such cases as when the head is worn out, there may be some effect.
4. For recording current adjustment, check the output of TP-4 with the oscilloscope and then Rec/PB to look at the playback output of TP-5 on the oscilloscope. Next, move VR205 and then Rec/PB to find the maximum playback output point. The voltage of TP-4 at this time becomes approximately 2.5 to 3.3Vp-p at Rec mode.
5. Apply a Colorbar signal into the video input, then adjust the trap coil T1 (Provided on the Connector P.C Board PY-5003).
    Camera-TV switch to TV position.
    First, remove the decoration panel on the right and adjust the trap coil through the case angle hole.

2) Audio Service Adjustment

Step	Adjustment Item	Test Point	Adjustment Parts	Mode	Result
1	PB Gain	Audio Out	VR101 5 kB	PB	Playback the US 1,000 Hz standard tape and adjust PB Gain Volume VR101 until 1V ±3 dBm is present at the Audio Out.
2	Trap Coil	TP-9	L102 23 mH	Rec	Connect an oscilloscope to TP-9. Bias level is reduce to minimum.
3	Bias Frequency	P905 ①	Confirmation	Rec	Connect a frequency Counter to each test point. 65 kHz ±7 kHz at Rec and Sound Dub mode.
		P905 ②	Confirmation	Sound Dub	
4	Rec/PB Gain	Audio Head Terminal	VR103 500 kB VR102 5 kB	Rec/PB (Apply a Signal of −60 dBm, 1 kHz to the Mic in Terminal)	Adjust VR103 until a bias voltage of 9V is obtainable at the Audio Head terminal. Then adjust VR102 so that the Rec/PB gain is 1V ±3 dBm at Audio Out. In this case, readjust the bias voltage, if not distortion is within 6%.
5	Frequency Response	Audio Out	Confirmation	Rec/PB (Apply an input of −90 dBm, 200Hz to 8kHz into Mic in Terminal)	Playback output from the Audio Out is +3/−6 dBm. If the output other than specified is obtained, readjust the bias voltage.
6	S/N Ratio	Audio Out	Confirmation	PB	1. Playback the US 1,000 Hz standard tape and then check Level. 2. Check level on PB mode without tape. 3. S/N ratio is more than −37 dB at PB mode.
7	E-E System Level	Audio Out	Confirmation	E-E (Apply an input of −60 dBm, 1,000 Hz into Mic in Terminal)	1V ±3 dBm at Audio Out.

3. SSG P.C BOARD (PY-5200) CONFIRMATION

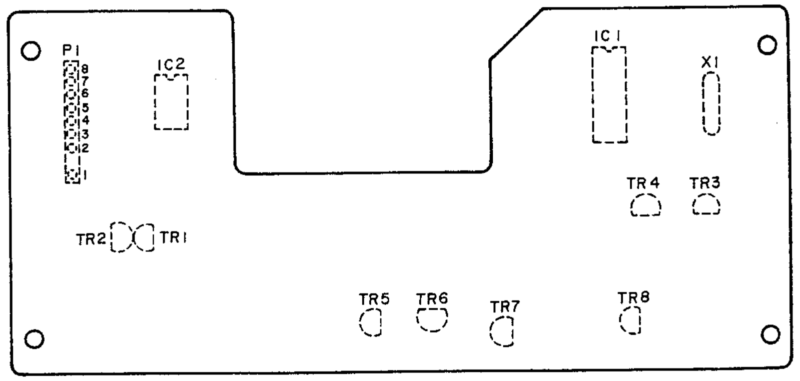

P1
8
7
6
5
4
3
2
1
IC2
IC1
X1
TR4
TR3
TR2
TR1
TR5
TR6
TR7
TR8

Fig. 9-13 SSG P.C BOARD (PY-5200) (Pattern side view)

1) VP OUT Confirmation (Plug P1 ①)

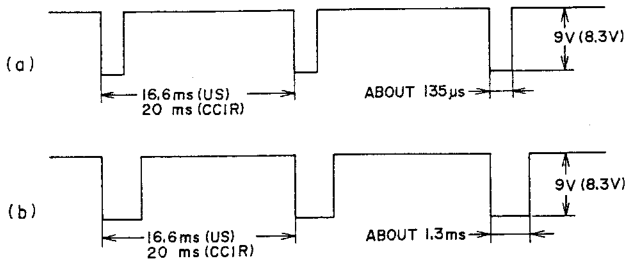

(a)
9V (8.3V)
16.6ms (US)
20 ms (CCIR)
ABOUT 135μs
(b)
9V (8.3V)
16.6ms (US)
20 ms (CCIR)
ABOUT 1.3ms

Fig. 9-14

NOTE: Fig. 9-14 (a) shows the waveform obtained when a video input is provided (except in the Playback mode).
Fig. 9-14 (b) shows the waveform obtained when no video input is provided and when a video input is provided in the Playback mode.
The voltage in this mode is approximately 9V or 8.3V.

2) H BL OUT Confirmation (Plug P1 ②)

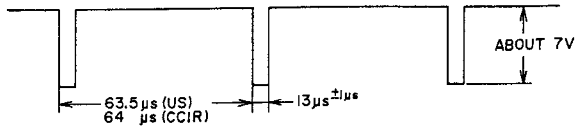

ABOUT 7V
63.5μs (US)
64 μs (CCIR)
13μs ±1μs

Fig. 9-15

3) V BL OUT Confirmation (Plug P1 ④)

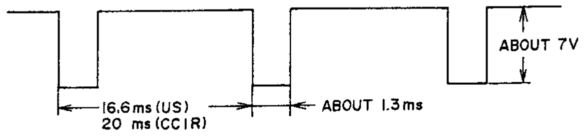

ABOUT 7V
16.6ms (US)
20 ms (CCIR)
ABOUT 1.3ms

Fig. 9-16

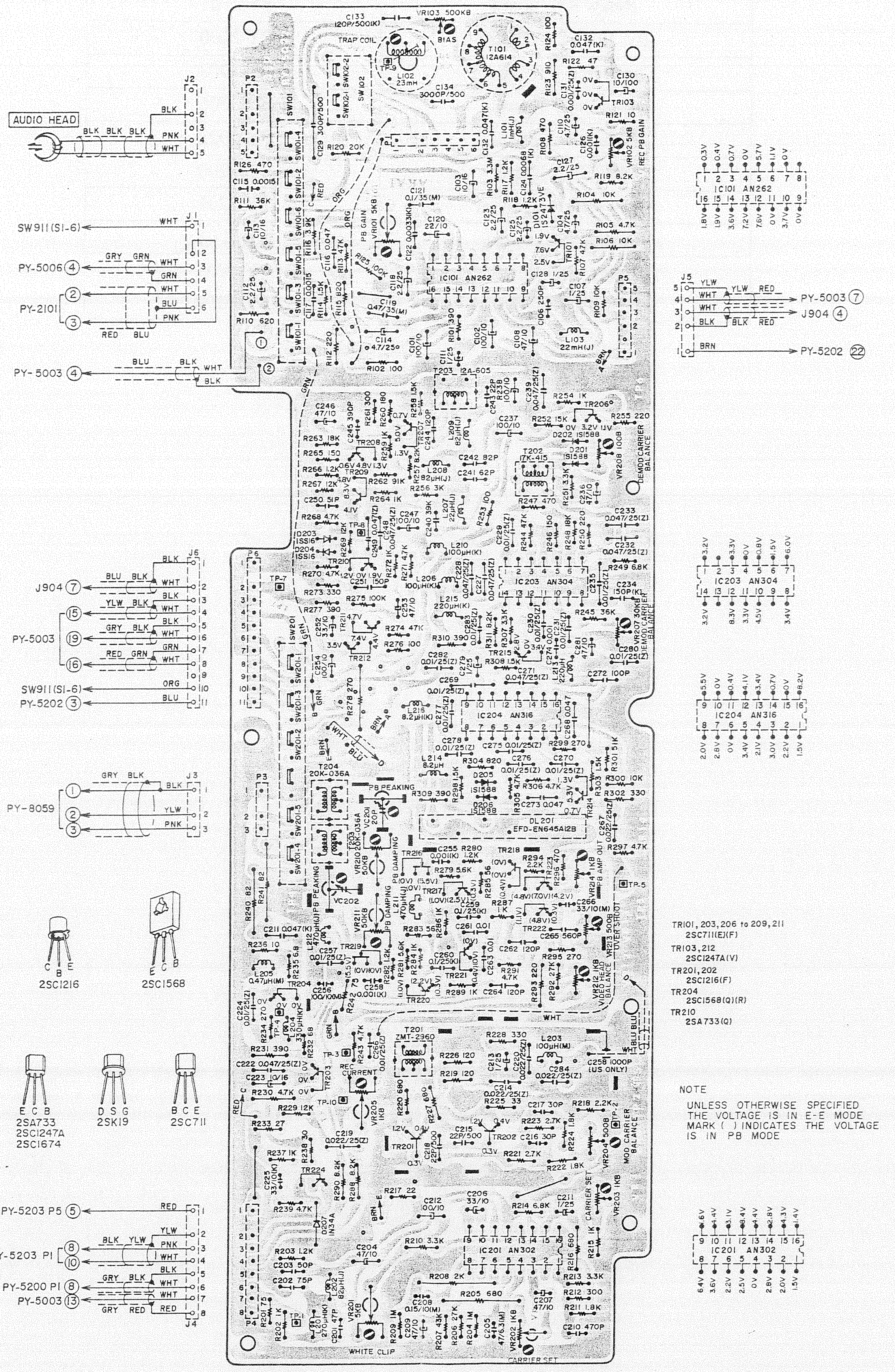
X. CLASSIFICATION OF VARIOUS P.C BOARDS

1. P.C BOARD TITLE AND IDENTIFICATION NUMBER

P.C Board	Number of P.C Board
Relay P.C Board	PY-2101
PV PLG P.C Board	PY-2200
Connector P.C Board	PY-5003
Fuse P.C Board	PY-5006
Signal P.C Board	PY-5022
SSG P.C Board	PY-5200
Shut Off P.C Board	PY-5201
Switch P.C Board	PY-5202
Servo P.C Board	PY-5203
PY Brush P.C Board	PY-8059

2. COMPOSITION OF VARIOUS P.C BOARDS

1) SIGNAL P.C BOARD (PY-5022)

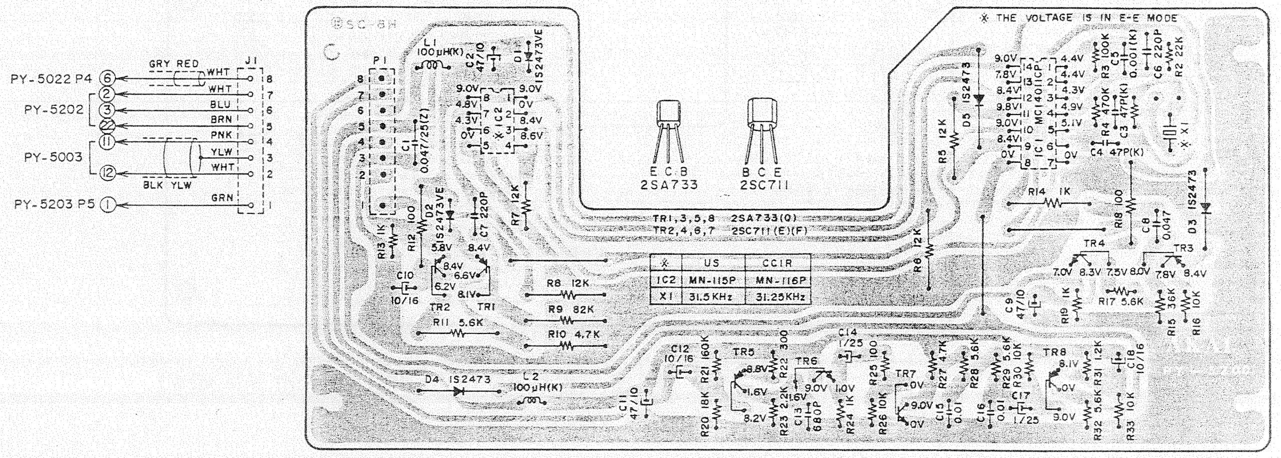

AUDIO HEAD
SW911 (S1-6)
PY-5006 ④
PY-2101
PY-5003 ④
J904 ⑦
PY-5003
SW911 (S1-6)
PY-5202 ③
PY-8059
PY-5203 P5 ⑤
PY-5203 P1
PY-5200 P1 ⑧
PY-5003 ⑬
PY-5003 ⑦
J904 ④
PY-5202 ㉒
IC101 AN262
IC203 AN304
IC204 AN316
IC201 AN302
2SC1216
2SC1568
2SA733
2SC1247A
2SC1674
2SK19
2SC711
WHITE CLIP
CARRIER SET
MOD CARRIER BALANCE
DEMOD CARRIER BALANCE
REC PB GAIN
BIAS
TRAP COIL

TR101, 203, 206 to 209, 211
2SC711(E)(F)
TR103, 212
2SC1247A(V)
TR201, 202
2SC1216(F)
TR204
2SC1568(Q)(R)
TR210
2SA733(Q)

NOTE

UNLESS OTHERWISE SPECIFIED THE VOLTAGE IS IN E-E MODE MARK ( ) INDICATES THE VOLTAGE IS IN PB MODE

2) SSG P.C BOARD (PY-5200)

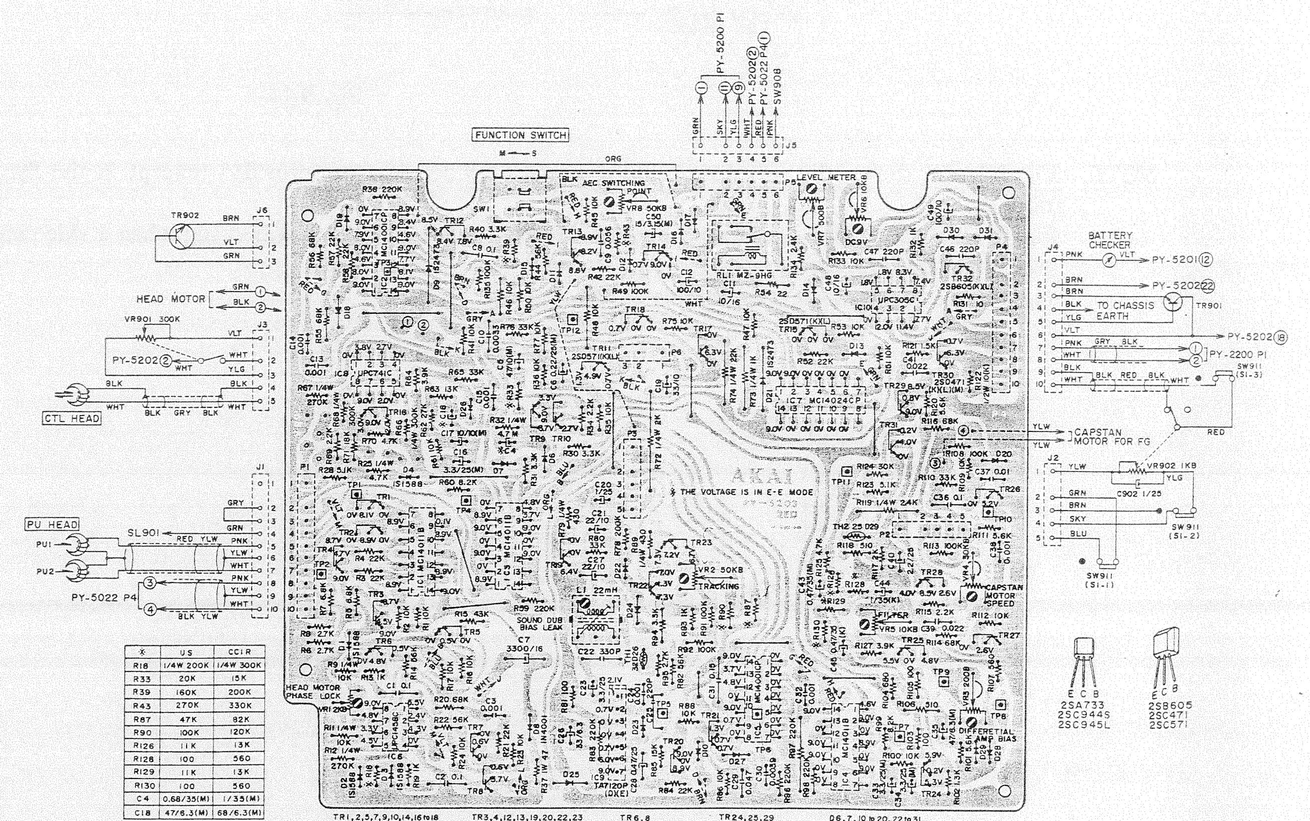

PY-5022 P4 ⑥
PY-5202
PY-5003
PY-5203 P5 ①
GRY RED
WHT
BLU
BRN
PNK
YLW
GRN
BLK YLW
J1
P1
E C B
2SA733
B C E
2SC711
IC1 MC14011CP
D4 1S2473
D5 1S2473
D2 1S2473

※ THE VOLTAGE IS IN E-E MODE

TR1, 3, 5, 8 2SA733(Q)
TR2, 4, 6, 7 2SC711(E)(F)

※	US	CCIR
IC2	MN-115P	MN-116P
X1	31.5KHz	31.25KHz

3) SERVO P.C BOARD (PY-5203)


PY-5200 P1
PY-5202 ⑫
PY-5022 P4 ①
SW908
FUNCTION SWITCH
LEVEL METER
TR902
HEAD MOTOR
VR901 300K
PY-5202 ⑧
CTL HEAD
PU HEAD
SL901
PU1
PU2
PY-5022 P4
BATTERY CHECKER
PY-5201 ⑫
PY-5202 ㉒
TO CHASSIS EARTH
TR901
PY-5202 ⑧
PY-2200 P1
SW911 (S1-3)
CAPSTAN MOTOR FG
SW911 (S1-2)
SW911 (S1-1)
CAPSTAN MOTOR SPEED
HEAD MOTOR PHASE LOCK
DIFFERETIAL AMP BIAS
SOUND DUB BIAS LEAK
AKAI
E C B
2SA733
2SC944S
2SC945L
2SB605
2SC671
2SC571

※ THE VOLTAGE IS IN E-E MODE

※	US	CCIR
R18	1/4W 200K	1/4W 300K
R33	20K	15K
R39	160K	200K
R43	270K	330K
R87	47K	82K
R90	100K	120K
R126	11K	13K
R128	100	560
R129	11K	13K
R130	100	560
C4	0.68/35(M)	1/35(M)
C18	47/6.3(M)	68/6.3(M)

TR1, 2, 5, 7, 9, 10, 14, 16 to 18
21, 26 to 28, 31
2SC945L(Q)(P)

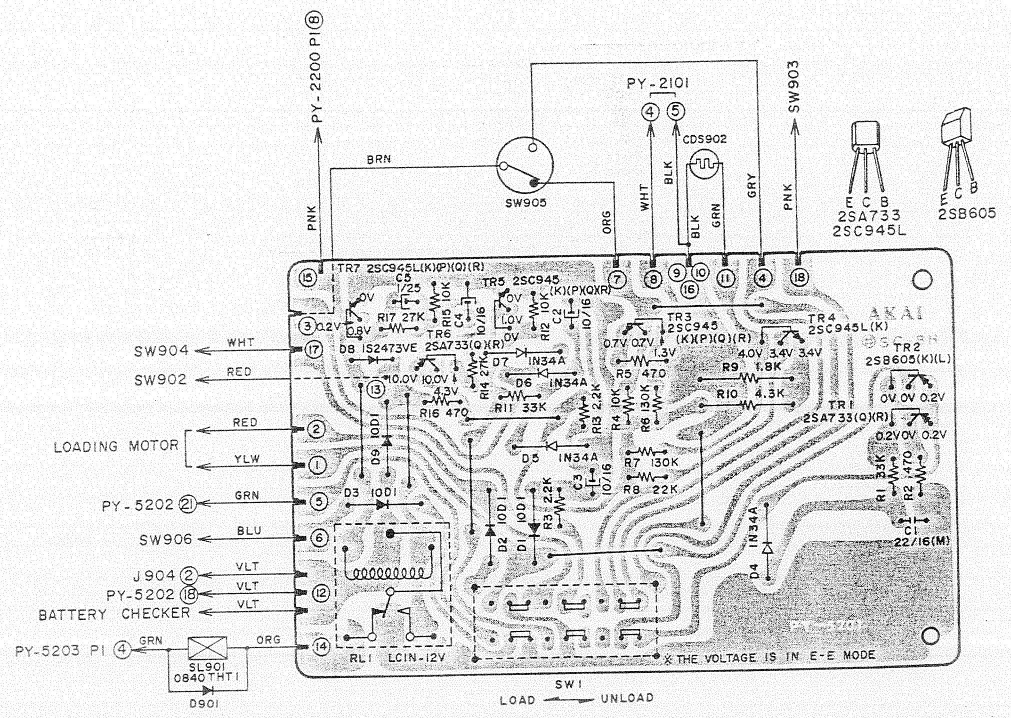
TR3, 4, 12, 13, 19, 20, 22, 23
2SA733(R)

TR6, 8
2SC944S(P)(K)

TR24, 25, 29
2SA733(Q)(R)

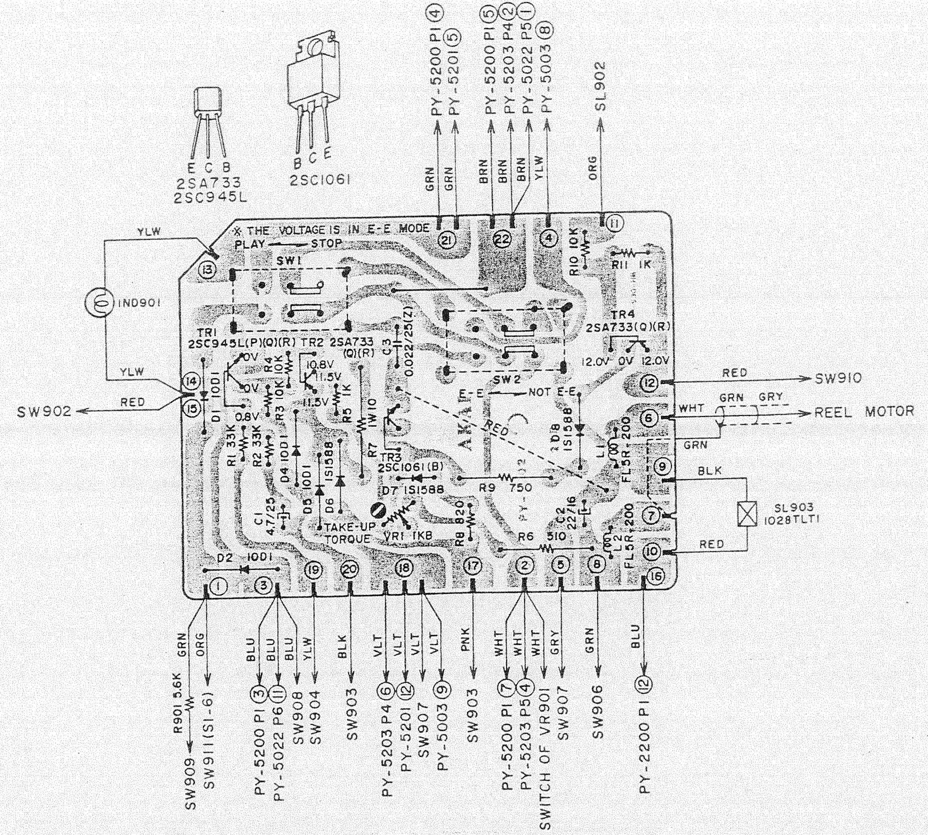
D6, 7, 10 to 20, 22 to 31
1S2473VE

4) SHUT OFF P.C BOARD (PY-5201)



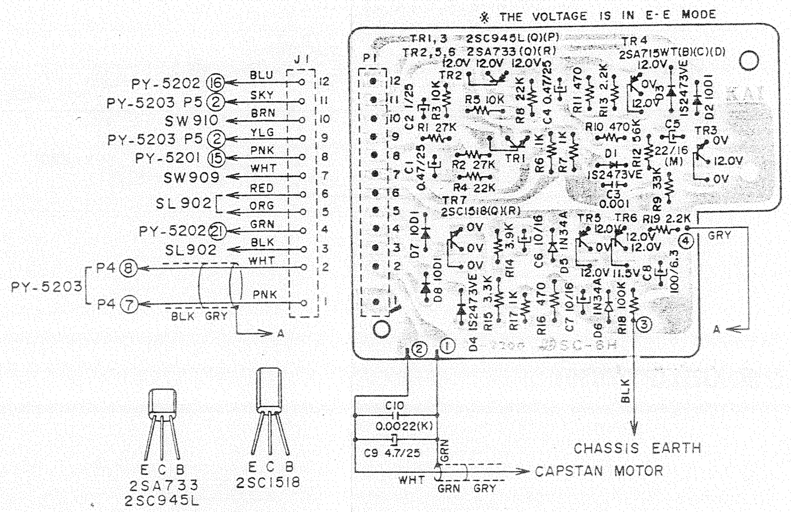
PY-2200 P1 ⑧
PY-2101
SW903
SW905
CDS902
2SA733
2SC945L
2SB605
E C B
SW904
SW902
LOADING MOTOR
PY-5202 ㉑
SW906
J904 ②
PY-5202 ⑱
BATTERY CHECKER
PY-5203 P1 ④
SL901 0840THT1
D901
AKAI
※ THE VOLTAGE IS IN E-E MODE
SW1
LOAD UNLOAD
RL1 LC1N-12V

5) SWITCH P.C BOARD (PY-5202)



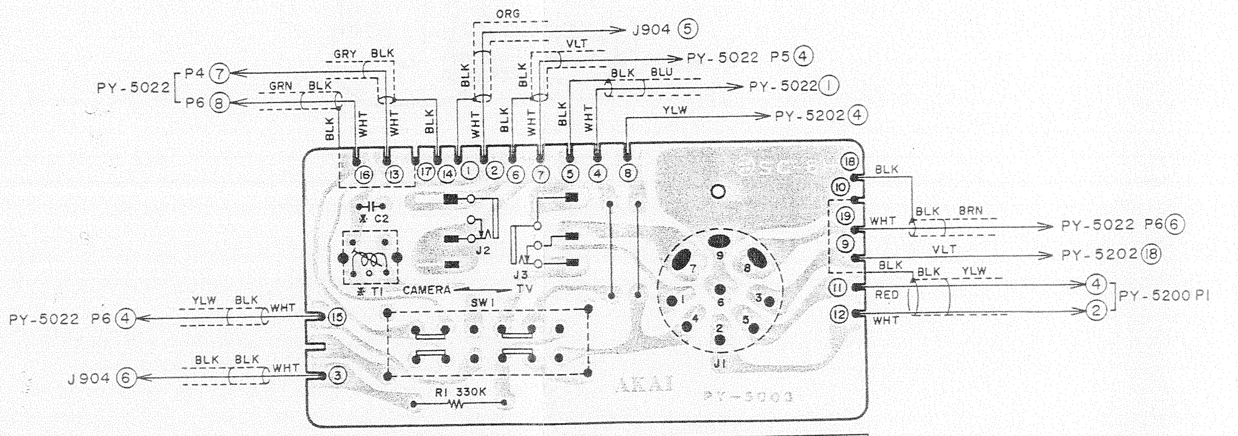
E C B
2SA733
2SC945L
B C E
2SC1061
PY-5200 P1 ④
PY-5201 ⑤
PY-5200 P1 ⑤
PY-5203 P4 ②
PY-5022 P5 ①
PY-5003 ⑧
SL902
※ THE VOLTAGE IS IN E-E MODE
PLAY STOP
SW1
SW2
NOT E-E
IND901
SW902
SW910
REEL MOTOR
SL903 1028TLT1
TAKE-UP TORQUE VR1 1KB
R901 5.6K
SW909
SW911 (S1-6)
PY-5200 P1 ③
PY-5022 P6 ⑪
SW908
SW904
SW903
PY-5203 P4 ⑥
PY-5201 ⑫
SW907
PY-5003 ⑨
SW903
PY-5200 P1 ⑦
PY-5203 P5 ④
SWITCH OF VR901
SW907
SW906
PY-2200 P1 ⑫

6) PV PLG P.C BOARD (PY-2200)



※ THE VOLTAGE IS IN E-E MODE
TR1,3 2SC945L(Q)(P)
TR2,5,6 2SA733(Q)(R)
TR4 2SA715WT(B)(C)(D)
TR7 2SC1518(Q)(R)
PY-5202 ⑯
PY-5203 P5 ②
SW910
PY-5203 P5 ②
PY-5201 ⑮
SW909
SL902
PY-5202 ②
SL902
PY-5203 P4 ⑧
P4 ⑦
J1
P1
CHASSIS EARTH
CAPSTAN MOTOR
E C B
2SA733
2SC945L
E C B
2SC1518
AKAI

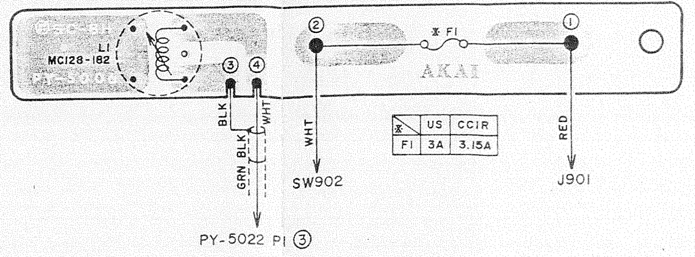
7) CONNECTOR P.C BOARD (PY-5003)



J904 ⑤
PY-5022 P5 ④
PY-5022 ①
PY-5202 ④
PY-5022 P4 ⑦
P6 ⑧
PY-5022 P6 ⑥
PY-5202 ⑱
PY-5200 P1
PY-5022 P6 ④
J904 ⑥
※ T1
CAMERA
TV
J2
J3
J1
SW1
R1 330K
AKAI
PY-5003

※	US	CCIR
T1	33Y-984	09A-1331
C2	820P	470P

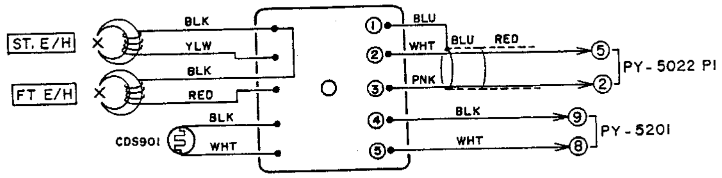
8) FUSE P.C BOARD (PY-5006)



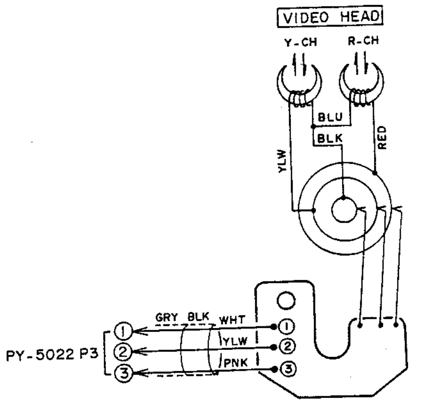
※ F1
L1
MC128-182
AKAI
SW902
J901
PY-5022 P1 ③

※	US	CCIR
F1	3A	3.15A

9) RELAY P.C BOARD (PY-2101)


ST. E/H
FT E/H
CDS901
BLK
YLW
BLK
RED
BLK
WHT
①
②
③
④
⑤
BLU
WHT
BLU
RED
PNK
BLK
WHT
⑤
②
PY-5022 P1
⑨
⑧
PY-5201

10) PY BRUSH P.C BOARD (PY-8059)


VIDEO HEAD
Y-CH
R-CH
BLU
BLK
YLW
RED
GRY
BLK
WHT
YLW
PNK
①
②
③
PY-5022 P3
①
②
③

MEMO

MEMO

SECTION 2

PARTS LIST

TABLE OF CONTENTS

1. RECOMMENDED SPARE PARTS LIST 54
2. VIDEO HEAD BLOCK 56
3. CAPSTAN BLOCK 58
4. KEYBOARD BLOCK 60
5. EJECTOR BLOCK 61
6. ASSEMBLY BLOCK 62
7. BATTERY CASE BLOCK 64
8. P.C BOARDS 65
    (1) SIGNAL P.C BOARD (PY-5022) BLOCK 65
    (2) SERVO P.C BOARD (PY-5203) BLOCK 66
    (3) SSG P.C BOARD (PY-5200) BLOCK 67
    (4) PLG P.C BOARD (PY-2200) BLOCK 67
9. FINAL ASSEMBLY BLOCK 68
10. LIST OF INTERCHANGEABLE SEMICONDUCTORS 69

INDEX 70

Resistor and Capacitor which is not listed in this parts list, please refer to COMMON LIST FOR SERVICE PARTS.

HOW TO USE THIS PARTS LIST

1. This parts list is compiled by various individual blocks based on assembly process.
2. When ordering parts, please describe parts number, serial number, and model number in detail.
3. How to read List

The reference number corresponds with illustration or photo number of that particular parts list.

This number corresponds with the Figure Number.

This number corresponds with the individual parts index number in that figure.

A small "x" indicates the inability to show that particular part in the Photo or Illustration.

12-115x

Schematic Diagram Number of individual manufactured part.
(not required for parts order)

Ref. No.	Parts No.	Description	Schematic No.
		FLYWHEEL BLOCK #13	
12-115x	800425	Flywheel Block Assy. Comp.	RDG =13
12-116	244506	Flywheel Only	RD-233
12-117x	244754	Felt, Flywheel	RD-275
12-118	251324	Main Metal Case	RD-236
12-119	253080	Main Metal	RD-237

4. The symbol numbers shown on the P.C. Board list can be matched with the Composite Views of Components of the Schematic Diagram or Service Manual.
5. Please utilize separate "Common List for Service Parts" for Resistor Parts orders.
6. The shape of the parts and parts name, etc. can be confirmed by comparing them with the parts shown on the Electrical Parts Table of P.C. Board.
7. Both the kind of part and installation position can be determined by the Parts Number. To determine where a parts number is listed, utilize Parts Index at end of Parts List.
   It is necessary first of all to find the Parts Number. This can be accomplished by using the Reference Number listed at right of parts number in the Parts Index. (meaning of ref. no. outlined in Item 3 above).
8. Utilize separate "Price List for Parts" to determine unit price. The most simple method of finding parts Price is to utilize the reference number.

CAUTION:
1. When placing an order for parts, be sure to list the parts no. model no., and description. There are instances in which if any of this information is omitted, parts cannot be shipped or the wrong parts will be delivered.
2. Please be careful not to make a mistake in the parts no. If the parts no. is in error, a part different from the one ordered may be delivered.
3. Because parts number and parts unit supply in the Preliminary Service Manual (Basic Parts List) may be partially changed, please use this parts list for all future reference.

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

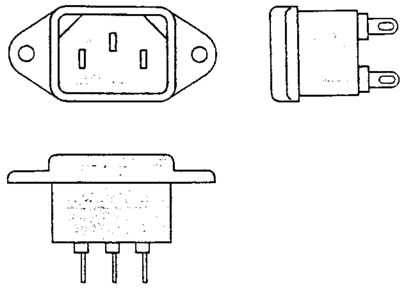
AVERTISSEMENT: ⚠ IL INDIQU LES COMPOSANTS CRITIQUES DE SURETE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.

AC INLET SYSTEM

This model is equipped with an AC INLET SYSTEM. Please refer to the AC INLET SYSTEM CHART below for the specific type. By the AC INLET SYSTEM, AC (mains) cord can be connected to and disconnected from the model because the model is provided with socket exclusively for AC (mains) cord on its main body.
Please note, however, that certain models are not equipped with this system and has a built-in AC (mains) cord as before.

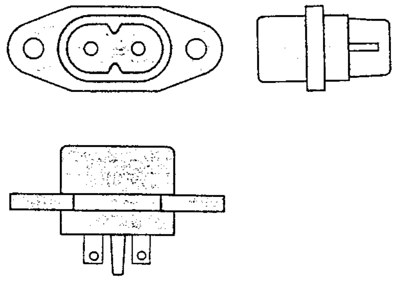
AC INLET SYSTEM CHART

CLASS I

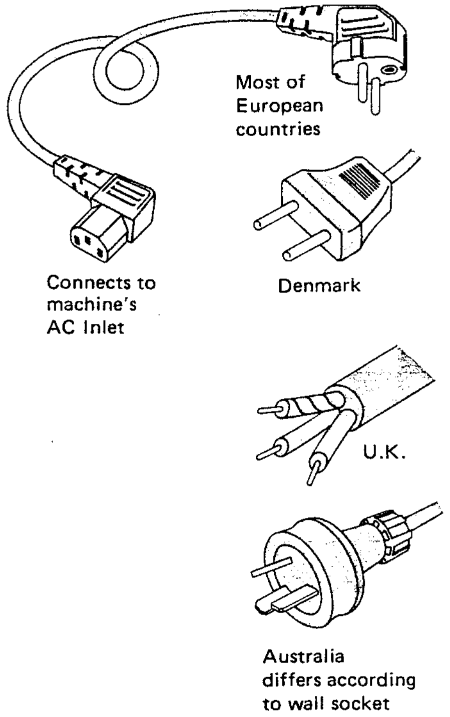


CLASS II

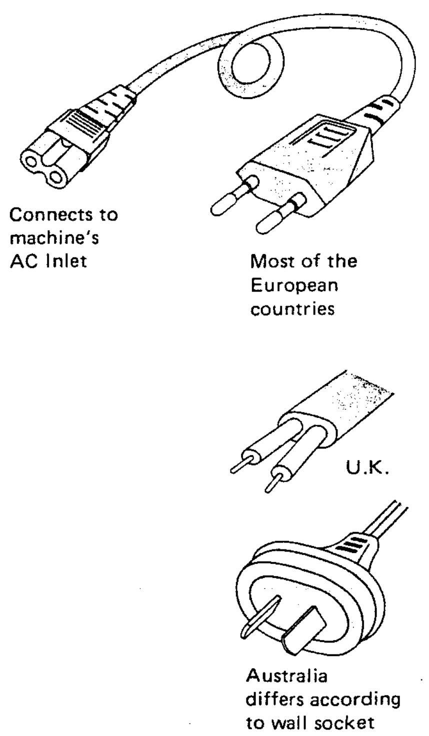
⧈ This mark indicating double insulation will be attached to machine's rear panel



Picture 1
AC INLET
to be
installed
on machines


Most of European countries
Connects to machine's AC Inlet
Denmark
U.K.
Australia differs according to wall socket

Picture 2
AC (mains)
cord


Connects to machine's AC Inlet
Most of the European countries
U.K.
Australia differs according to wall socket

Parts List for AC (mains) Cord Set

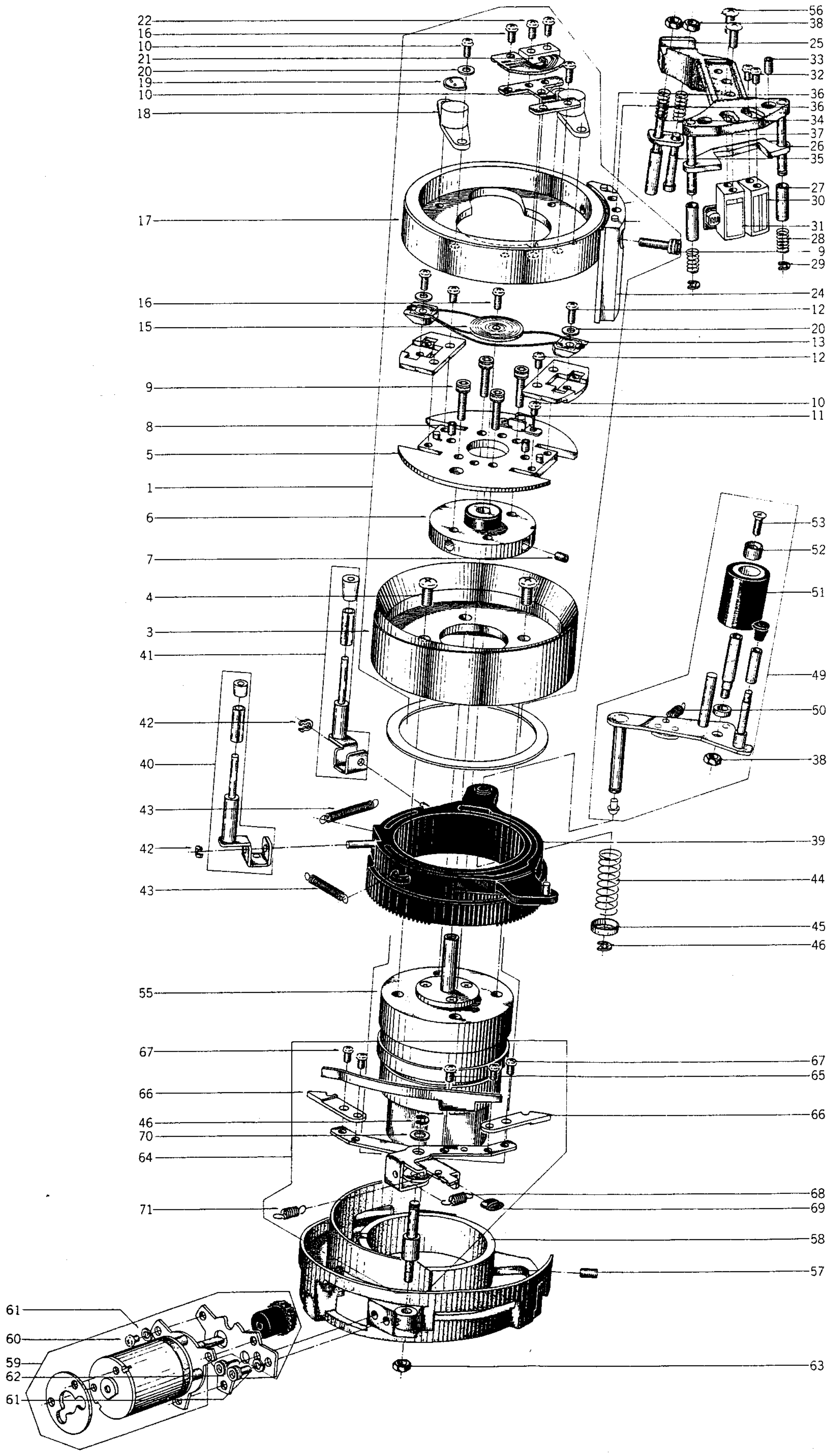
Standard		Description	Type of AC Inlet	Parts No.
Class I	CEE	Cord Set CEE (3 cores)	3P	EW302993
	BEAB	Cord Set BEAB (3 cores)	3P	EW302994
	SAA	Cord Set SAA (3 cores)	3P	EW302996
	U/T	Cord Set U/T (3 cores)	3P	EW302646
Class II	CEE	Cord Set CEE (2 cores)	2P	EW638144
	BEAB	Cord Set BEAB (2 cores)	2P	EW302995
	SAA	Cord Set SAA (2 cores)	2P	EW302991
	U/T	Cord Set U/T (2 cores)	2P	EW302899

1. RECOMMENDED SPARE PARTS LIST

Because, if the parts listed below are on hand, almost any repair can be accomplished, we suggest that you stock these Recommended Spare Parts Items.

Parts No.	Description	Note
BA302431	SW. P.C Board Comp. VT-350	
BA303351	Shut Off P.C Board Comp. VT-350	
BA303548	Signal P.C Board Comp. VT-350 (US)	
BA303549	Signal P.C Board Comp. VT-350 (CCIR)	
BA303545	Servo P.C Board Comp. VT-350 (US)	
BA303546	Servo P.C Board Comp. VT-350 (CCIR)	
BA302433	SSG P.C Board Comp. VT-350 (US)	
BA302434	SSG P.C Board Comp. VT-350 (CCIR)	
BA303350	PLG P.C Board Comp. VT-350	
BK303479	Keyboard Block Comp. VT-350	
BM291183	Motor Block Comp. VT-300	
BM300851	Gear Motor Assy PY	
BM302672	Capstan Motor Block Comp. VT-350 (GSM-200)	
BM303920	Motor Block Comp. VT-350 (GSM-310)	
BR301746	Reel Table (L) Block Comp. VT-300	
BR301745	Reel Table (R) Block Comp. VT-300	
BV303844	Rotary Head Block Comp. VT-350 (US)	
BV303845	Rotary Head Block Comp. VT-350 (CCIR)	
EF497407	Fuse 3A 125V (US)	
EF620280	Fuse (T Type) 3.15AT (CCIR)	
EI634454	IC AN262	IC101 (PY-5022)
EI572681	IC AN-302	IC201 (PY-5022)
EI572692	IC AN-304	IC203 (PY-5022)
EI297180	IC AN-316	IC204 (PY-5022)
EI257602	IC MC14011B	IC1 (PY-5203), IC2 (PY-5200)
EI639505	IC MC14001CP	IC5 (PY-5203)
EI301748	IC μPC1458C	IC6 (PY-5203)
EI639483	IC MC14024BCP	IC7 (PY-5203)
EI301749	IC μPC741C	IC8 (PY-5203)
EI302172	IC TA7120P (D) (E)	IC9 (PY-5203)
EI213827	IC μPC305C	IC10 (PY-5203)
EI301381	IC MN-115P (US)	IC1 (PY-5200)
EI301382	IC MN-116P (CCIR)	IC1 (PY-5200)
EI309427	Crystal Osc. 31.5 kHz (US)	X1 (PY-5200)
EI309426	Crystal Osc. 31.25 kHz (CCIR)	X1 (PY-5200)
EL256893	Lamp 12V 60 mA (150mm×2)	
EM304443	Level Meter D12A59R	
EP257940	Relay LC1N-12V	RL1
EP303575	Plunger Solenoid 0840PHT1	SL901
EP303906	Plunger Solenoid 1028TLTI-1	SL903
EP261180	Plunger Solenoid 1229THT	SL902
ET303828	CDS P201D-5RB	CDS902
ET423224	FET 2SK19 (BL)	TR216, 217 (PY-5022)
EV238375	Vol. (W/SW.) V12M4-IS 7.5T-B300K	VR901
EV303763	Vol. V16L4S 1 kB	VR902
HC261292	AUDIO, CTL HEAD VTR-1X2R-P22-004	
HE271541	F.T. ERASE HEAD EF-300	
HE271552	SIDE ERASE HEAD ES-300	
HR300298	VIDEO HEAD VH-57 (30U) (US)	
HR271506	VIDEO HEAD VH-57 (30C) (CCIR)	
MB253866	Counter Belt	
MB422267	Counter Belt (A) D55.6x1.1x1.1 PX-A115	
MB253574	Flywheel Belt	
MC256792	Counter KMP388	
MP256184	Pinch Roller VT-300	
MR253787	Motor Pulley VT-300	
SB303816	Loading Button	
SK303745	Control Knob	
SK458583	Tracking Knob	
VT357041	Slip Ring (1400 Type)	
VT258838	Brush N01330C	

2. ILLUSTRATION OF VIDEO HEAD BLOCK

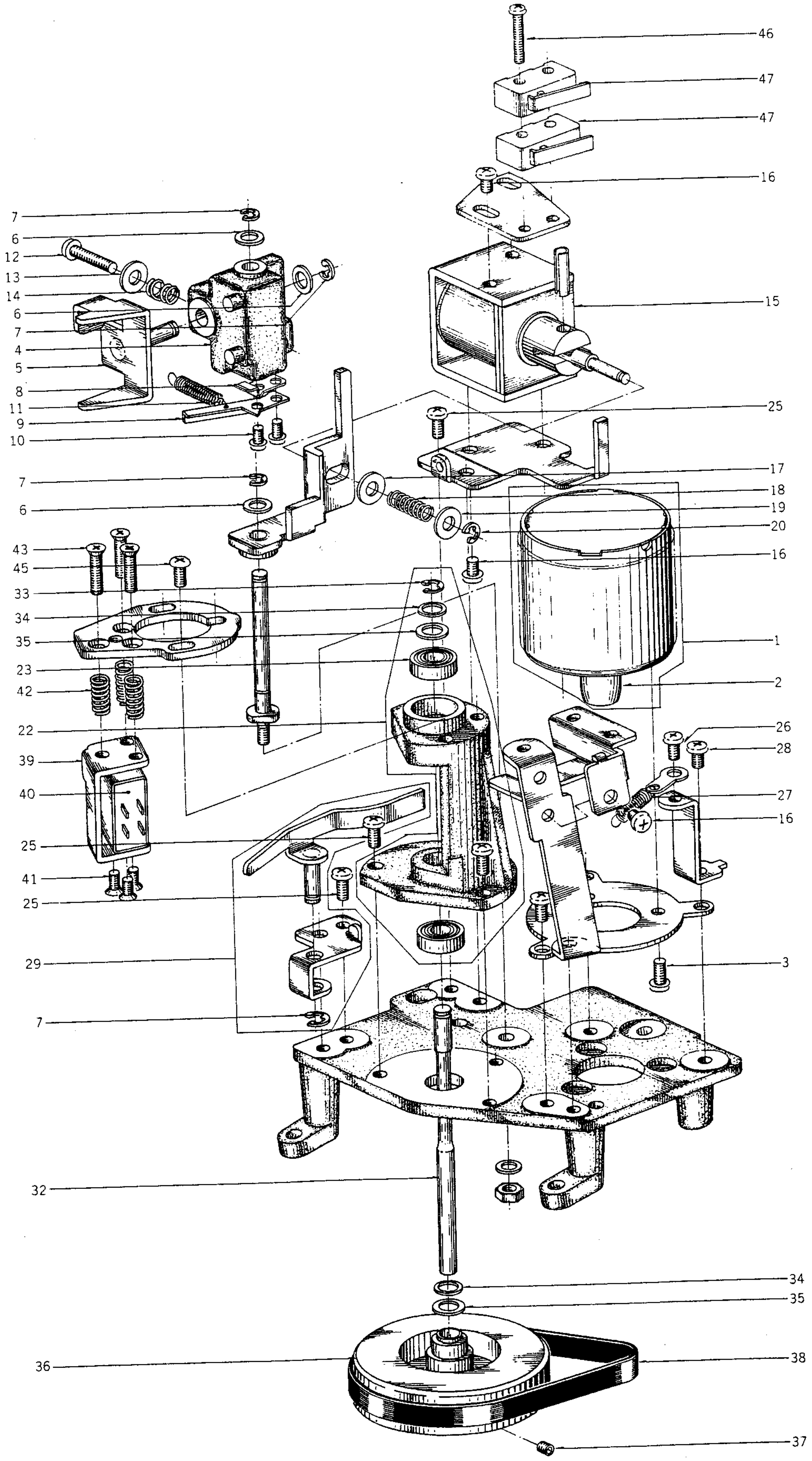


2) VIDEO HEAD BLOCK

Ref. No.	Parts No.	Description	Schematic No.
		ROTARY HEAD BLOCK	
2-1	BV303844	Rotary Head Block Comp. VT-350 (US)	
2-2x	BV303845	Rotary Head Block Comp. VT-350 (CCIR)	
2-3	VT253945	Lower Drum	PY-8050
2-4	ZS201194	Screw, truss head 4x10	
2-5	VT291150	Head Plate Part VT-300	PY-8040
2-6	VT303219	Head Plate Holder (C)	PY-8076/8077
2-7	ZS261336	Set Screw, hexagon socket 3x4 (CUP/P.)	
2-8	ZS356804	Set Screw, hexagon socket 3x4 (CUP/P.)	
2-9	ZS419938	Hexagon socket Bolt, 3x8 (Knurl)	
2-10	ZS201418	Screw, pan head 2.3x4	
2-11	VT253260	Magnet Shield Part VT-300	
2-12	ZS201936	Screw, binding head 2.3x6	
2-13	HR300298	VIDEO HEAD VH-57 (30U) (US)	
2-14x	HR271506	VIDEO HEAD VH-57 (30C) (CCIR)	
2-15	VT357041	Slip Ring (1400 Type)	52-1-3
2-16	ZS419940	Screw, pan head 2.3x6	
2-17	VT303368	Upper Drum (A)	PY-8074
2-18	VT303291	PU Head (B) T-5821	37-2-13
2-19	EA301753	PG P.C Board	PY-8066
2-20	ZW438557	Washer (BSP) D2.3x6x0.3t	
2-21	VT258838	Brush N01330C	52-1-36
2-22	ZS356837	Screw, pan head 2x5	
2-23x	ZS201475	Screw, pan head 2x3	
2-24	VT302032	Drum Support Part VT-300	PY-8075
		FIXATION HEAD BASE BLOCK	
2-25	HZ280056	Fixation Head Base Part VT-300	PY-8033
2-26	VT255227	Tape Guide Plate	PY-8035
2-27	MS254193	S Guide	PY-8034
2-28	ZG252000	Spring, S guide	PY-8036
2-29	ZW270088	'E' Ring 1.9M	6-1-9
2-30	HE271541	F.T ERASE HEAD EF-300	
2-31	HE271552	SIDE ERASE HEAD ES-300	
2-32	ZS460440	Screw, pan head 2x4	
2-33	ZS285750	Adjust Screw	PY-8065
2-34	MS254204	T Guide (A)	PY-8038
2-35	MS254226	T Guide (B)	PY-8044
2-36	ZG252033	Spring, T guide	PY-8039
2-37	VT303746	Tape Holder	PY-8201
2-38	ZW273756	Nut M3, #1	
		LOADING RING BLOCK	
2-39	VT253552	Loading Ring	PY-8007
2-40	ML305971	Guide Pin Arm (A) Assy VT-350	
2-41	ML305979	Guide Pin Arm (B) Assy VT-350	
2-42	ZW356657	'E' Ring 1.5M	6-1-9
2-43	ZG251998	Spring, regular pin	PY-8014
2-44	ZG304711	Clamp Spring (B)	PY-8218
2-45	MZ802980	Spring Holder	RD-276
2-46	ZW270101	'E' Ring 3M	6-1-9
2-47x	ZW381644	Washer (Polyslider) D2.1x4x0.13t	
2-48x	ZW305546	Washer (Polyslider) D2.1x4x0.25t	
		PINCH ROLLER ARM BLOCK	
2-49	BV304104	Pinch Roller Arm Block Comp. VT-350	
2-50	ZG365433	Idler Tension Spring	RCC-1365
2-51	MP256184	Pinch Roller VT-300	PY-8025
2-52	VT254171	Pinch Roller Support	PY-8025
2-53	ZS433315	Screw, countersunk head 2.3x8	
2-54x	ZW273802	Toothed Lock Washer, M3	
		MOTOR BLOCK	
2-55	BM291183	Motor Block Comp. VT-300	

Ref. No.	Parts No.	Description	Schematic No.
		DRUM BLOCK	
2-56	ZS269256	Screw, truss head 2.6x8	
2-57	ZS269267	Set Screw, hexagon socket 4x6 (CONE/P.)	
		DRUM HOLDER BLOCK	
2-58	VT280866	Drum Holder Part VT-300	PY-8015
2-59	BM300851	Gear Motor Assy PY	
2-60	ZS427048	Screw, round head 3x3	
2-61	ZW273745	Spring Washer M3	
2-62	ZW258840	Hexagon Bolt, 3x6	
2-63	ZW273835	Nut M3, #1	
		LOCK ARM BLOCK	
2-64	BV3038373	Lock Arm Block Comp. VT-350	
2-65	ZS417216	Screw, pan head 3x4	
2-66	VT238421	Lock Arm (B) Piece	PY-8055
2-67	ZS417161	Screw, pan head 2.3x4	
2-68	ZG303752	PV Lock Arm (B) Spring	PY-8213
2-69	VT253732	Rubber Bush	PY-1030
2-70	ZW259738	Washer (Polyslider) D4.1x7x0.25t	
2-71	VT238432	Lock Arm (A) Spring	PY-8060

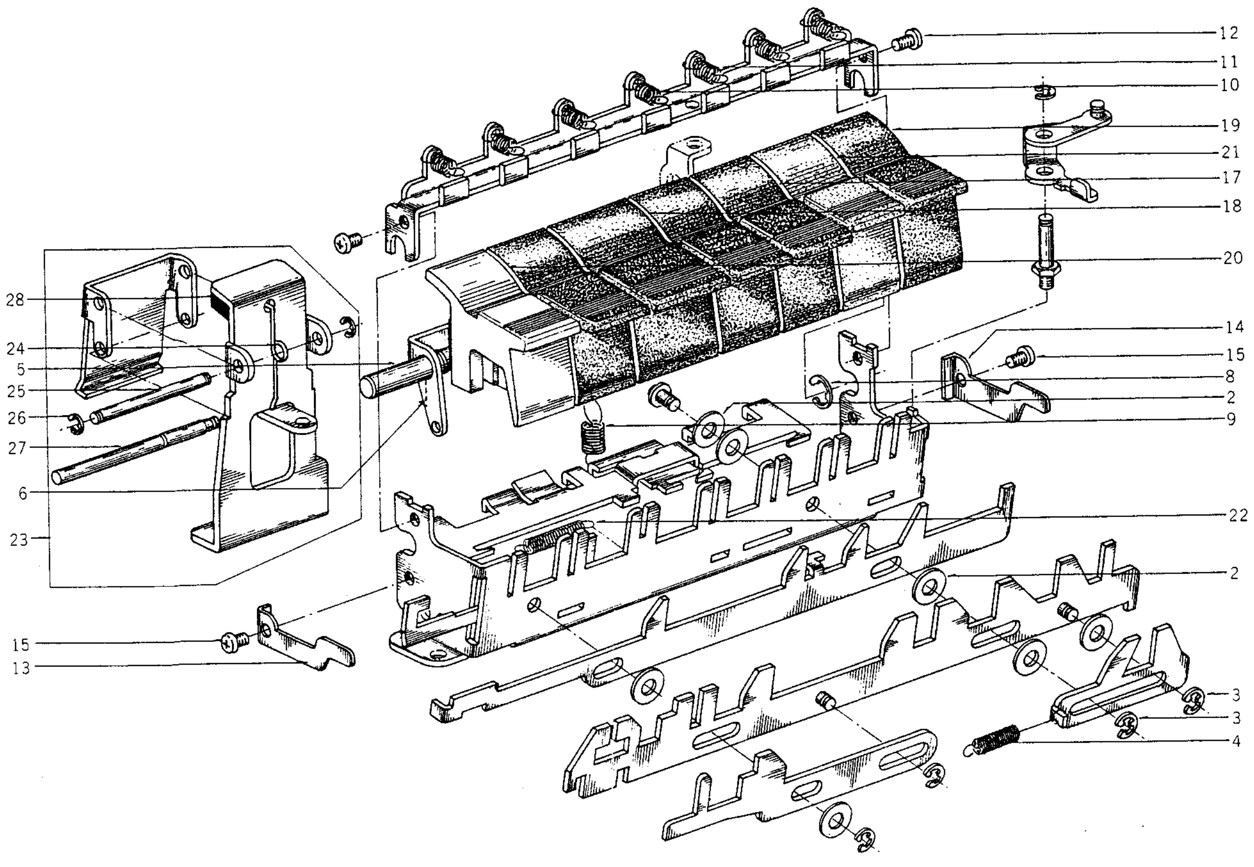
3. ILLUSTRATION OF CAPSTAN BLOCK



3) CAPSTAN BLOCK

Ref. No.	Parts No.	Description	Schematic No.
		CAPSTAN BLOCK	
3-1	BM302672	Capstan Motor Block Comp. VT-350 (GSM-200)	
3-2	MR305258	Capstan Motor Pulley (B)	PY-2080
		CAPSTAN MOTOR BASE BLOCK	
3-3	ZS432843	Screw, pan head 2.6×4	
		MAIN PLUNGER BLOCK	
3-4	ML253855	Pinch Roller Arm (A)	PY-2087
3-5	VT266231	Pinch Roller Support Part VT-300	PY-2088
3-6	ZW259738	Washer (Polyslider) D4.1×7×0.25t	
3-7	ZW270101	'E' Ring 3M	6-1-9
3-8	ZG252898	Pinch Roller Guide Spring (B)	PY-2092
3-9	ZG252865	Pinch Roller Guide Spring (A)	PY-2091
3-10	ZS417161	Screw, pan head 2.3×4	
3-11	ZG251943	Pinch Roller Return Spring	PY-2083
3-12	ZS305504	Screw, bind head 3×15	
3-13	ZW402287	Washer (SPC) D3.1×8×0.5t	
3-14	ZG362801	CTL Angle Adjust Spring	PX-816
3-15	EP261180	Plunger Solenoid 1229THT	44-1-85
3-16	ZS417216	Screw, pan head 3×4	
3-17	ZW306068	Washer (BSP) D3.3×6×0.5t	
3-18	ZG251954	Pinch Roller Return Spring	PY-2100
3-19	ZW302332	Washer (BSP) D3.1×8×0.5t	
3-20	ZW270088	'E' Ring 1.9M	6-1-9
3-21x	ZW414145	Washer (Polyslider) D4.1×7×0.13t	
		CAPSTAN MT. BASE BLOCK	
3-22	MV300808	Capstan Case Part PY	
3-23	MV261246	Bearing SMR115ZZSMC2EP6PS2	
3-24x	ZS414033	Screw, countersunk head 3×8	
3-25	ZS379350	Screw, pan head 3×6	
3-26	ZS422076	Screw, pan head 3×5	
3-27	ZG251976	Tension Arm Spring	PY-2122
3-28	ZS379350	Screw, pan head 3×6	
3-29	VT280001	Pinch Roller Guide Plate Part VT-300	PY-2095
3-30x	ZW273802	Toothed Lock Washer, M3	
3-31x	ZW273756	Nut M3, #1	
3-32	MS254845	Capstan Shaft	PY-2073
3-33	ZW270123	'E' Ring 4M	6-1-9
3-34	VT256127	Damper, capstan	PY-2076
3-35	ZW288764	Washer D5.1×7.8×0.2t	
3-36	MI253776	Flywheel	PY-2074
3-37	ZS391476	Set Screw, hexagon socket 4×4 (CUP/P.)	
3-38	MB253574	Flywheel Belt	PY-2081
3-39	VT252808	Audio Head Base (A)	PY-2077
3-40	HC261292	AUDIO, CTL HEAD VTR-1X2R-P22-004	37-2-3
3-41	ZS524812	Screw, countersunk head 2×4	
3-42	ZG251875	Spring, audio head	PY-2079
3-43	ZS262260	Screw, countersunk head 2.6×12	
3-44	VT255723	Audio Head Base (B)	PY-2078
3-45	ZS269627	Screw, truss head 2.6×6	
3-46	ZS670004	Screw, pan head 2.3×16	
3-47	ES477966	Micro SW. SS-5GL	25-1-23

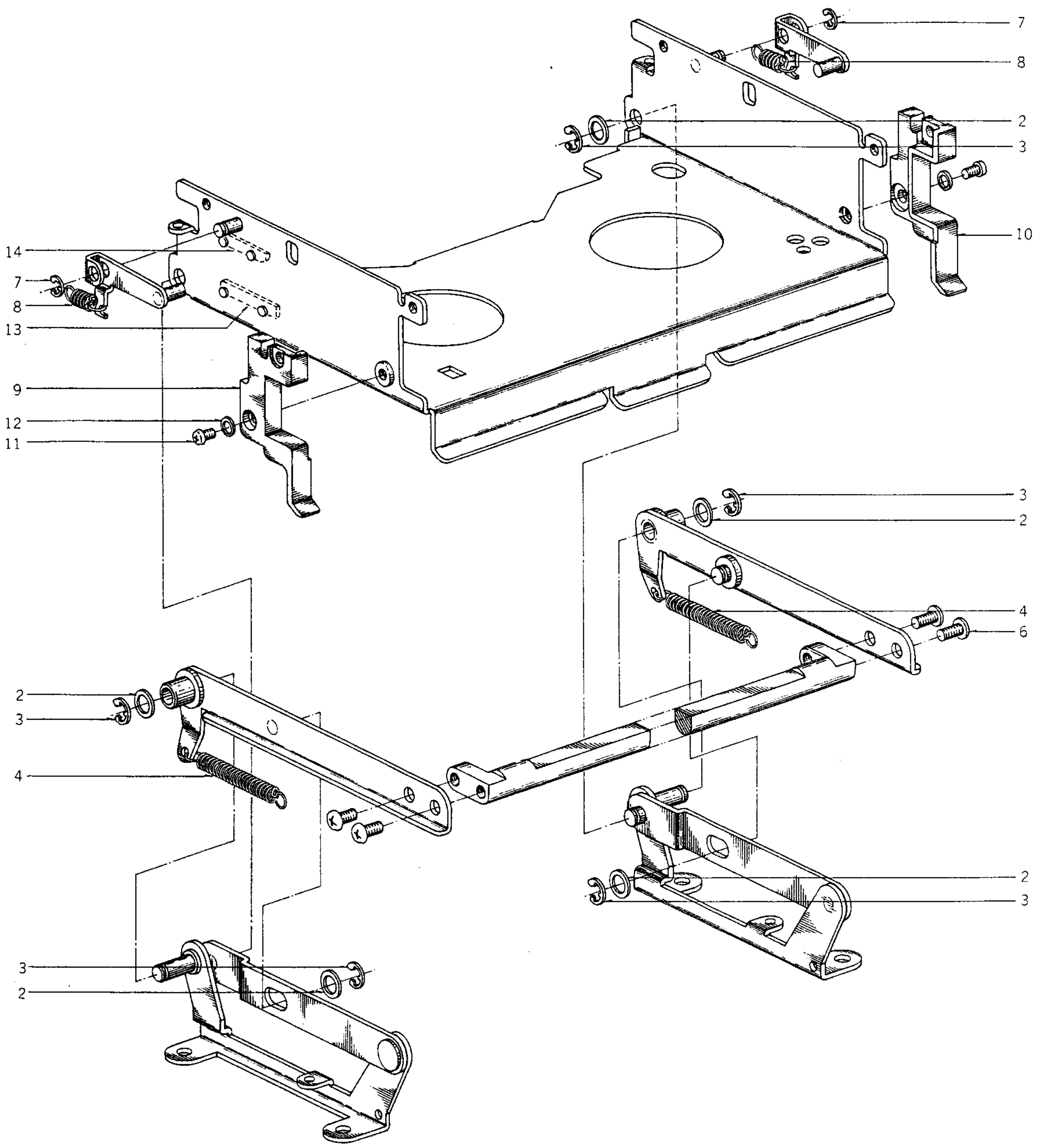
4. ILLUSTRATION OF KEYBOARD BLOCK



4) KEYBOARD BLOCK

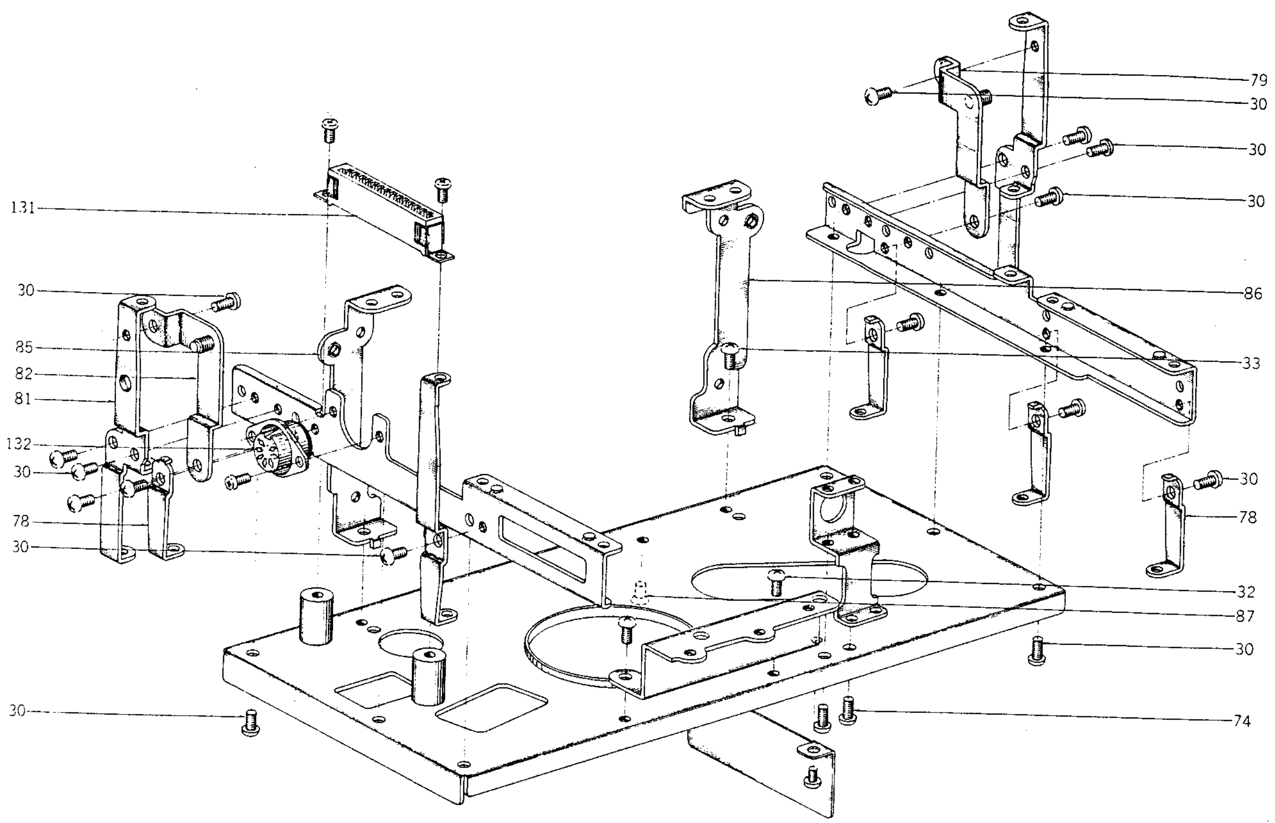
Ref. No.	Parts No.	Description	Schematic No.
4-1x	BK303479	Keyboard Block Comp. VT-350	13-2-52
4-2	ZW460787	Washer (Polyslider) D3.1x8x0.25t	
4-3	ZW357164	'E' Ring 2.3M	6-1-9
4-4	ZG303730	Return Spring	PY-2212
4-5	MS251818	Keyboard Shaft	PY-2049
4-6	ZG303741	PV Key Spring (A)	PY-2224
4-7x	MH251763	Operation Pin	PY-2046
4-8	ZW270123	'E' Ring 4M	6-1-9
4-9	ZG251662	Lock Plate Spring	PY-2033
4-10	ZG385571	REC Safety Spring (B)	CS-1048
4-11	ZG251965	Keyboard F.F. Spring	PY-2112
4-12	ZS417161	Screw, pan head 2.3x4	
4-13	ZG255857	Plate Spring (A)	PY-2040
4-14	ZG251234	Plate Spring (B)	PY-2040
4-15	ZS201407	Screw, pan head 2.3x3	
4-16x	ZW300888	Washer D2.3x6x0.4t	
4-17	SK253822	Operation Button (A)	PY-2041
4-18	SK253833	Operation Button (B)	PY-2042
4-19	SK253844	Operation Button (C)	PY-2043
4-20	SK251278	Operation Button (C-E)	PY-2043
4-21	SK251256	Operation Button (C-R)	PY-2043
4-22	ZG451574	Slider Pull Spring	RCC-1207B
4-23	VT300638	Eject Stopper Assy VT-300	PY-9709
4-24	ZG251504	Ejector Lock Spring	PY-1042
4-25	MS254035	Ejector Lock Shaft (A)	PY-1044
4-26	ZW356657	'E' Ring 1.5M	6-1-9
4-27	MS254542	Ejector Lock Shaft (B)	PY-1045
4-28	VT253901	Sponge	PY-1043

5. ILLUSTRATION OF EJECTOR BLOCK



5) EJECTOR BLOCK

Ref. No.	Parts No.	Description	Schematic No.
5-1x	BV303921	Ejector Block Comp. VT-350	PY-9729
5-2	ZW259738	Washer (Polyslider) D4.1x7x0.25t	
5-3	ZW270101	'E' Ring 3M	6-1-9
5-4	ZG303742	PV Ejector Spring	PY-2225
5-5	VT254384	Ejector Bar	PY-2064
5-6	ZS383951	Screw, truss head 3x5 (Black)	
5-7	ZW301319	'E' Ring 2.3M (Black)	6-1-9
5-8	ZG251853	Hold Spring	PY-2063
5-9	VT253585	Ejector Piece (A)	PY-2062
5-10	VT253618	Ejector Piece (B)	PY-2062
5-11	ZS267254	Screw, pan head 2.3x4 (Black)	
5-12	ZW267232	Washer D2.4x4.5x0.5 (SPC)	
5-13	VT253890	Release Claw (A)	PY-2060
5-14	VT253631	Release Claw (B)	PY-2061

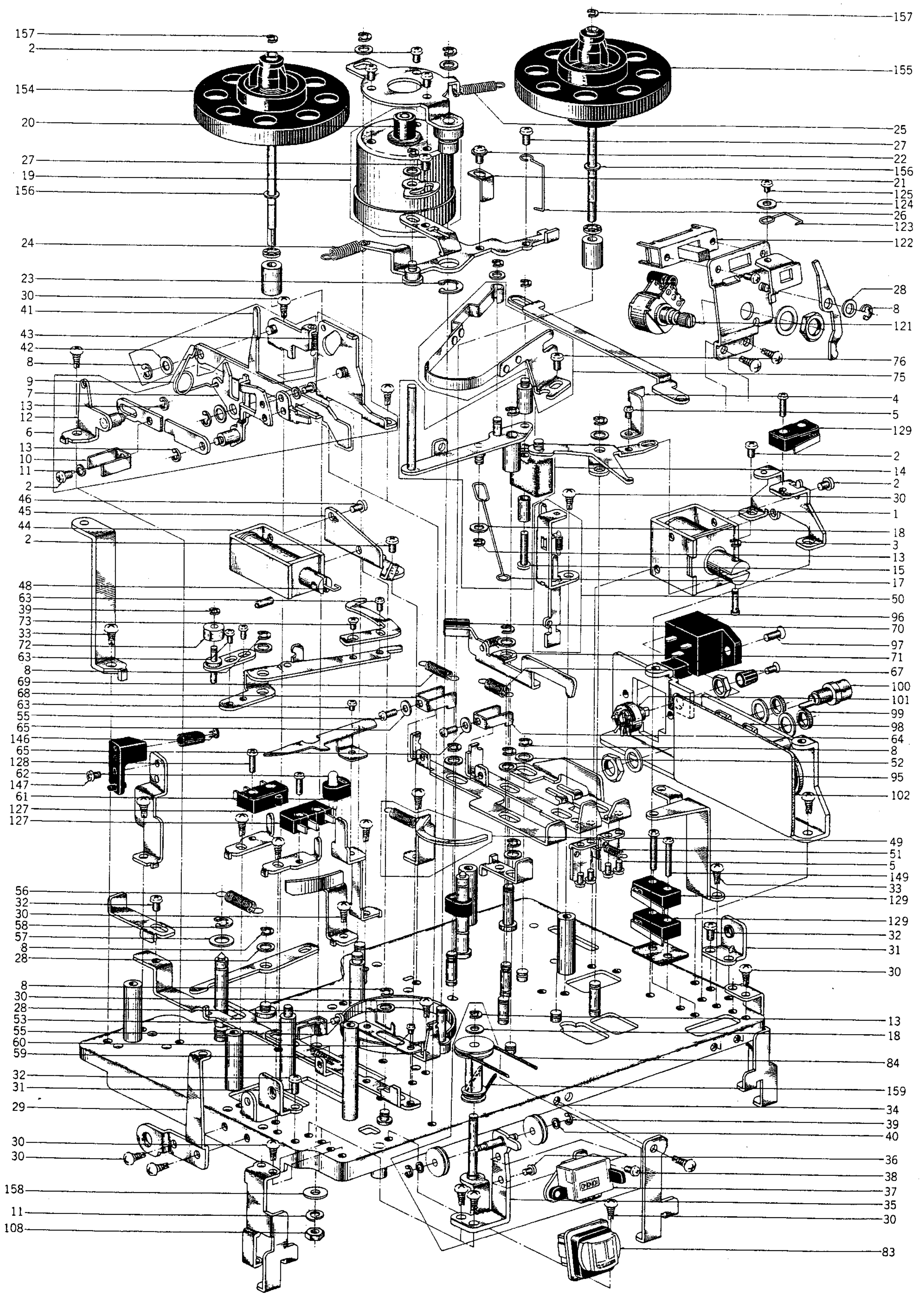


6) ASSEMBLY BLOCK

Ref. No.	Parts No.	Description	Schematic No.
		REWIND PLUNGER BLOCK	
6-1	EP303906	Plunger Solenoid 1028TLTI-1	44-1-96
6-2	ZS417216	Screw, pan head 3x4	
6-3	ZW356657	'E' Ring 1.5M	6-1-9
6-4	VT303807	Actuater	PY-1218
6-5	ZS201407	Screw, pan head 2.3x3	
		LOADING LEVER BLOCK	
6-6	BV303480	Loading Lever Block Comp. VT-350	PY-9806
6-7	ML303912	Loading Lever Part VT-350	PY-1225
6-8	ZW270101	'E' Ring 3M	6-1-9
6-9	ZG303817	Loading Spring	PY-1228
6-10	VT303886	Slide SW. Spring, loading	PY-1230
6-11	ZW273745	Spring Washer M3	
6-12	MZ303913	PV Spring Hanger (B) Part VT-350	PY-1231
6-13	ZW357164	'E' Ring 2.3M	6-1-9
		TENSION ARM BLOCK	
6-14	BV303879	Tension Arm Block Comp. VT-350	PY-9720
6-15	ZS590073	Screw, pan head 3x14	
6-16x	ZW273914	Spring Washer, M4	
6-17	VT303809	Pull Bar	PY-1220
6-18	ZW269954	Washer D3.1x7x0.25t	
		MOTOR BLOCK	
6-19	BM303920	Motor Block Comp. VT-350 (GSM-310)	
6-20	MR253787	Motor Pulley VT-300	PY-2009
		REEL MOTOR TABLE BLOCK	
6-21	ZG252720	FF Spring	PY-2016
6-22	ZS608321	Screw, pan head 3x6, W=8	
6-23	ZW334653	'E' Ring 7M	6-1-9
6-24	ZG303711	Push Lever Spring	PY-1232
6-25	ZG516418	Eject Spring	CG-1238
6-26	VT303726	SW. Push Wire	PY-2208
6-27	ZS422076	Screw, pan head 3x5	
6-28x	ZW259738	Washer (Polyslider) D4.1x7x0.25t	
		MECHA FRAME BLOCK	
6-29	ML255341	Case Angle (N)	PY-1024
6-30	ZS325495	Tapping Screw, #2, 3x6 (BR)	
6-31	ML252617	Stop Pin Angle	PY-1017
6-32	ZS379350	Screw, pan head 3x6	
6-33	ZS609120	Tapping Screw #2, 3x6 (Pan)	
6-34	MZ302272	Relay Pulley Assy VT-300(B)	PY-9730
6-35	VT266321	Relay Pulley Bracket Part VT-300	PY-1033
6-36	ZS432843	Screw, pan head 2.6x4	
6-37	MC256792	Counter KMP388	9-1-47
6-38	ZS460440	Screw, pan head 2x4	
6-39	ZW356657	'E' Ring 1.5M	6-1-9
6-40	ZW381644	Washer (Polyslider) D2.1x4x0.13t	
6-41	ML252336	Key Lock Lever (B)	PY-1074
6-42	ZW414145	Washer (Polyslider) D4.1x7x0.13t	
6-43	ZG456120	Setting Lever Spring	CS-1187
6-44	EP303575	Plunger Solenoid 0840PHT1	44-1-92
6-45	VT252393	Release Plunger Bracket	PY-1057
6-46	ZS432843	Screw, pan head 2.6x4	
6-47x	ED624903	Silicon Diode 1S2473	45-3-28
6-48	VT303719	PV Joint Wire	PY-1241
6-49	VT308144	Brake Band Support Assy VT-300	
6-50	VT300551	Safety Bracket Assy VT-300	PY-9715
6-51	ZG451574	Slider Pull Spring	RCC-1207B
6-52	ZW305556	Washer D4.3x11x0.25t	
6-53	VT303798	Micro SW. Spring (B)	PY-1210
6-54x	ZW300888	Washer D2.3x6x0.4t	
6-55	ZS201407	Screw, pan head 2.3x3	
6-56	VT305570	Key Lock Slide Plate Spring (B)	PY-1249
6-57	ZW396437	Washer (Polyslider) D5.1x10.3x0.25t	
6-58	ZW270123	'E' Ring 4M	6-1-9
6-59	ZG303801	Clamp Spring	PY-1213
6-60	ZS303936	Screw, pan head 2x2	
		ASSEMBLY BLOCK	
6-61	CT253877	Lamp Bush	PY-1028
6-62	EL256893	Lamp 12V 60mA (150mmx2)	28-2-51
6-63	ZS417161	Screw, pan head 2.3x4	
6-64	ZG252630	Slide SW. Spring	PY-1016
6-65	ZW623687	Washer (SPC) D2.3x6x0.4t	
6-66x	ZW305556	Washer D4.3x11x0.25t	
6-67	ZG251605	REC Return Spring	PY-1108
6-68	ZG252630	Slide SW. Spring	PY-1016
6-69	ZG301379	Play Return Spring	PY-1119
6-70	VT303717	PV Brake Shoe	PY-1239
6-71	ZG305162	Brake Spring	PY-1245
6-72	MR253642	Cam Roller	PY-1084
6-73	ZS483456	Screw, countersunk head 2.3x4	
6-74	ZS327835	Screw, countersunk head 3x5	
6-75	VT265680	Brake Band Holder Part VT-300	PY-1117
6-76	ZS323728	Screw, binding head 3x5	
6-77	ML255677	Case Angle (I)	PY-1095
6-78	ML255780	P.C Board Angle (F)	PY-1094
6-79	ML304324	Case Angle (M) Part VT-300	PY-1124
6-80x	ZS432674	Screw, pan head 3x3	
6-81	ML255543	Case Angle (H)	PY-1099
6-82	ML304222	Case Angle (L) Part VT-300	PY-1124
6-83	EM304443	Level Meter D12A59R	46-1-185
6-84	MB253866	Counter Belt	PY-1038
6-85	ML255521	Case Angle (F)	PY-1103
6-86	ML251223	Case Angle (G)	PY-1103
6-87	ZS200676	Tapping Screw #2, 3x6 (Countersunk)	
6-88x	BV303877	Harness Block Comp. VT-350 (US)	26-6-279
6-89x	BV303878	Harness Block Comp. VT-350 (CCIR)	26-6-280
6-90x	BT238364	Trans. 33Y-984 (US)	23-1-268
6-91x	BT267906	Trans. 09A-1331 (CCIR)	23-1-271
6-92x	EC412593	Styrol/C. (Vert. Type) 820PF (J) 50WV (US)	24-11-3
6-93x	EC405898	Styrol/C. (Vert. Type) 470PF (J) 50WV (CCIR)	24-11-3
6-94x	ES238353	Slide SW. SSB04253	25-3-128
6-95	EJ308892	Socket CS818-1-7 (Gray)	31-1-210
6-96	EJ238318	3P SW. Socket S-I6947	31-1-162
6-97	ZS425992	Screw, countersunk head 3x8 (Black)	
6-98	EJ238331	Jack SJ-357-1-3	31-2-78
6-99	VT422537	Nylon Collar for Jack D3.5	PX-A147
6-100	EJ305229	PIN Jack VA-0036 (US)	31-1-213
6-101	EV238375	Vol. (W/SW) V12M4-IS 7.5T-B300k	36-25-6
6-102	BA302431	SW. P.C Board Comp. VT-350	
6-103x	ES257231	Slide SW. SSB02219	25-3-122
6-104x	EO669273	Inductor FL5R-200	23-1-248
6-105x	ET515733	Transistor 2SC945L(P)(Q)(R)	45-1-85
6-106x	ET557965	Transistor 2SA733(Q)(R)	45-1-124
6-107x	ET362261	Transistor 2SC1061(B)	45-1-96
6-108x	ZW273756	Nut M3, #1	
6-109x	ED224526	Silicon Diode 10D1	45-2-11
6-110x	ED557447	Silicon Diode 1S1588	45-3-22
6-111x	ER658124	Metal Oxide Film/R. 1W 10 ohms (J)	35-15-17
6-112x	EV522404	Semi-fixed/Vol. V8K1-1 1 kB	36-10-267
6-113x	BA303351	Shut Off P.C Board Comp. VT-350	
6-114x	ES302282	Slide SW. SSP06211	25-3-138
6-115x	EP257940	Relay LC1N-12V	47-1-27
6-116x	ET666415	Transistor 2SB605(k)(L)	45-1-225
6-117x	ET658102	Transistor 2SC945L(K)	45-1-85
6-118x	ED219464	Germanium Diode 1N34A	45-3-1
6-119x	ED560913	Silicon Diode 1S2473 VE	45-3-23
6-120x	EC575188	Tantalum/C. (DTS Type) 22μF(M) 16WV	24-15-8
6-121	EV303763	Vol. V16L4S 1 kB	36-22-32
6-122	ES302287	Slide SW. SSC-362B	25-3-139
6-123	VT303724	Slow SW. Push Wire	PY-2204
6-124	ZW550697	Washer (SPC) D2.9x7.4x0.5t	
6-125	ZS592378	Screw, pan head 2.6x3	
6-126x	ES477966	Micro SW. SS-5GL	25-1-23
6-127	ES304788	Micro SW. SSL08-U	25-1-47
6-128	ZS487091	Screw, pan head 2.3x8	
6-129	ES246598	Micro SW. SS-5GL-111	25-1-38
6-130x	ZS487091	Screw, pan head 2.3x8	
6-131	EJ232132	RF Converter Connector 100-010-006 (US)	31-4-27
6-132	EJ238162	Monitor Connector CS1270	31-1-160
6-133x	EJ306816	7P Plung Housing 171822-7	31-1-222
6-134x	EJ306820	Touch Terminal 170262-1	32-1-90
6-135x	EJ306821	Touch Terminal 170263-1	32-1-91
6-136x	EJ238195	Crimp Type Housing 5047-5	31-1-170
6-137x	EJ281057	Mini Connect. Terminal 2759-PBT2	32-1-77
6-138x	EJ238173	Crimp Type Housing 5047-3	31-1-170
6-139x	EJ305224	Connector Terminal 2759G	32-1-83
6-140x	EJ303347	Crimp Type Housing 5047-8	31-1-170
6-141x	EJ306817	6P Plug Housing 171822-6	31-1-222
6-142x	EJ306819	12P Plug Housing 1-171822-2	31-1-222
6-143x	EJ238285	Crimp Type Housing 5047-12	31-1-170
6-144x	EJ303858	Crimp Type Housing 5047-10	31-1-170
6-145x	EJ238228	Crimp Type Housing 5047-6	31-1-170
6-146	ET303828	CDS P201D-5R B	45-9-4
6-147	ZS499331	Screw, pan head 2.3x5	
6-148x	ZS421806	Screw, pan head 3x8	
6-149	ZS670004	Screw, pan head 2.3x16	
6-150x	ZW303789	Micro SW. washer	PY-1112
6-151x	ZS262607	Tapping Screw #2, 2.3x10(BR)	
6-152x	ZS421806	Screw, pan head 3x8	
6-153x	ZW414145	Washer (Polyslider) D4.1x7x0.13t	
6-154	BR301746	Reel Table (L) Block Comp. VT-300	13-2-33
6-155	BR301745	Reel Table (R) Block Comp. VT-300	13-2-32
6-156	ZW511457	Washer (Polyslider) D3.3x6x0.25t	
6-157	ZW301319	'E' Ring 2.3M (Black)	6-1-9
6-158	ZW305549	Washer D3.5x10x1t	
6-159	MB422267	Counter Belt (A) D55.6x1.1x1.1	PX-A115
6-160x	ZW394086	Washer (Nylon) D4.1x7x1t	
6-161x	ZS447761	Tapping Screw #2, 3x6 (BR) (Black)	
6-162x	ZS608444	Screw, pan head 3x16	
6-163x	ZS344305	Screw, pan head 3x10	
6-164x	ZW616004	Washer D3.1x8x1t	
6-165x	ZS553983	Screw, pan head 2.6x6	
6-166x	EJ303216	3P Connector Harness VT-300	26-6-270
6-167x	ZW550642	Washer (SPC) D3.1x8x0.5t	

When ordering parts, please describe Parts Nber, Description, and Model Number in detail.

6. ILLUSTRATION OF ASSEMBLY BLOCK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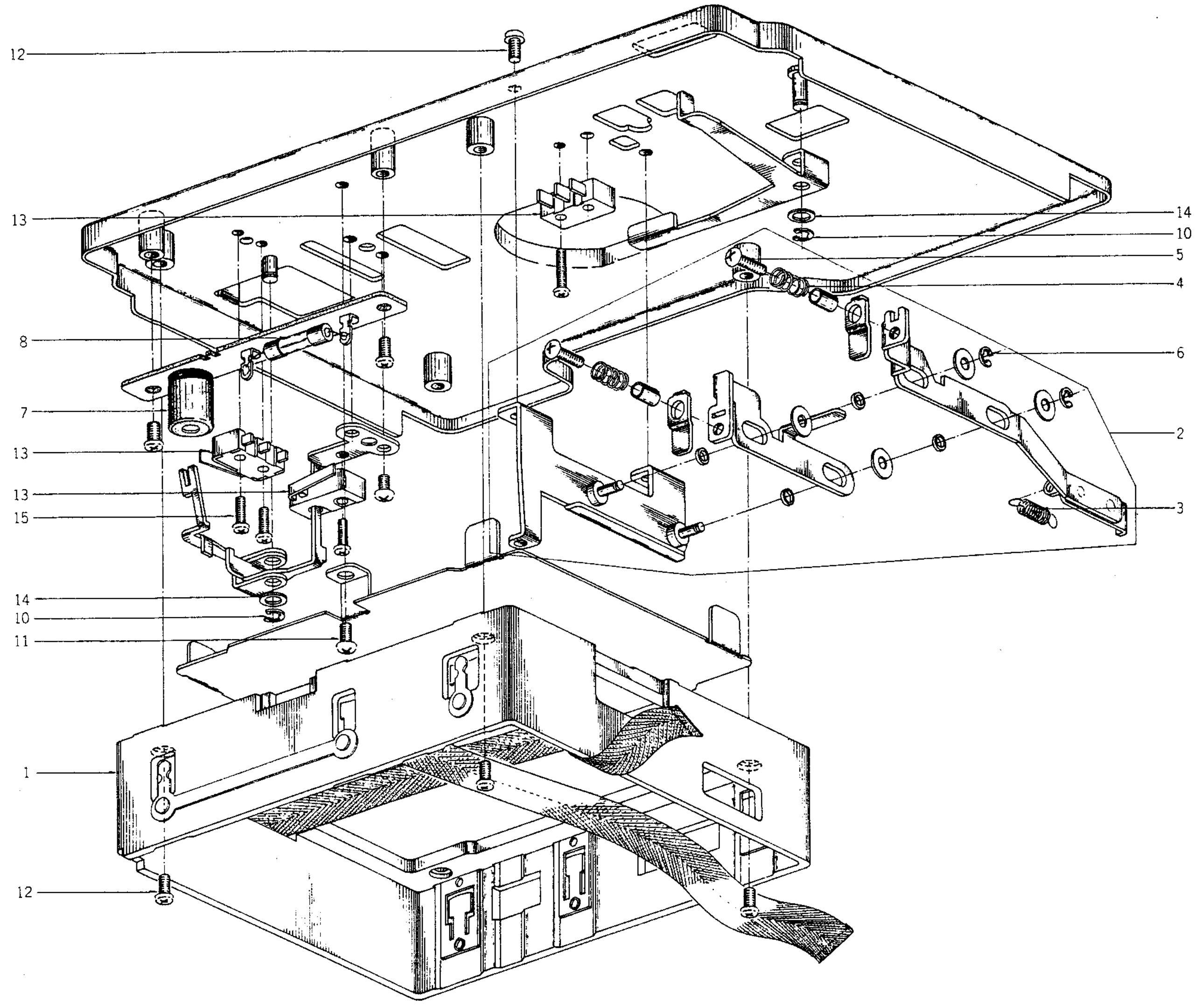
7. ILLUSTRATION OF BATTERY CASE BLOCK



7) BATTERY CASE BLOCK

Ref. No.	Parts No.	Description	Schematic No.
7-1	BC430637	Battery Case Block Comp. VT-110, 150, PW	PX-A406
		SLIDE LEVER BLOCK	
7-2	BL271372	Slide Lever Block Comp. VT-300	PY-9723
7-3	ZG251447	SW. Push Lever (A) Spring	PY-2118
7-4	ZG251458	SW. Push Lever (B) Spring	PY-2117
7-5	ZS481454	Screw, truss head 3x12	
7-6	ZW270088	'E' Ring 1.9M	6-1-9
		FUSE P.C BOARD BLOCK	
7-7	EO257321	Inductor 182	23-1-267
7-8	EF497406	Fuse 3A 125V (US)	39-1-44
7-9x	EF620280	Fuse (T Type) 3.15AT (CEE) (CCIR)	
7-10	ZW270101	'E' Ring 3M	6-1-9
7-11	ZS447761	Tapping Screw #2, 3x6 (BR) (Black)	
7-12	ZS422076	Screw, pan head 3x5	
7-13	ES477966	Micro SW. SS-5GL	25-1-23
7-14	ZW259738	Washer (Polyslider) D4.1x7x0.25t	
7-15	ZS487091	Screw, pan head 2.3x8	

8. P.C BOARDS

(1) SIGNAL P.C BOARD (PY-5022) BLOCK

Symbol No.	Parts No.	Description	Schematic No.
(1)-1	BA303548	Signal P.C Board Comp. VT-350 (US)	
(1)-2	BA303549	Signal P.C Board Comp. VT-350 (CCIR)	
(1)-DL201	EI297191	Delay Line EFD-EN645A12B	58-1-9
(1)-IC101	EI634454	IC AN-262	45-8-150
(1)-IC201	EI572681	IC AN-302	45-8-98
(1)-IC203	EI572692	IC AN-304	45-8-91
(1)-IC204	EI297180	IC AN-316	45-8-215
(1)-TR101	ET453486	Transistor 2SC711(E)(F)	45-1-67
(1)-TR103	ET520288	Transistor 2SC1247A(V)	45-1-131
(1)-TR201, 202	ET572703	Transistor 2SC1216(F)	45-1-169
(1)-TR203	ET453486	Transistor 2SC711(E)(F)	45-1-67
(1)-TR204	ET303256	Transistor 2SC1568(Q)(R)	45-1-287
(1)-TR206 to 209	ET453486	Transistor 2SC711(E)(F)	45-1-67
(1)-TR210	ET522268	Transistor 2SA733(Q)	45-1-124
(1)-TR211	ET453486	Transistor 2SC711(E)(F)	45-1-67
(1)-TR212	ET520288	Transistor 2SC1247A(V)	45-1-131
(1)-TR214, 215	ET453486	Transistor 2SC711(E)(F)	45-1-67
(1)-TR216	ET423224	FET 2SK19(BL)	45-12-3
(1)-TR217	ET646132	Transistor 2SC1674(K)(L)	45-1-206
(1)-TR218	ET398711	Transistor 2SC945L(Q)(R)	45-1-85
(1)-TR219	ET423224	FET 2SK19(BL)	45-12-3
(1)-TR220	ET646132	Transistor 2SC1674(K)(L)	45-1-206
(1)-TR221	ET398711	Transistor 2SC945L(Q)(R)	45-1-85
(1)-TR222	ET646132	Transistor 2SC1674(K)(L)	45-1-206
(1)-TR223	ET398711	Transistor 2SC945L(Q)(R)	45-1-85
(1)-TR224	ET453486	Transistor 2SC711(E)(F)	45-1-67
(1)-D101	ED560913	Silicon Diode 1S2473 VE	45-3-23
(1)-D201, 202	ED557447	Silicon Diode 1S1588	45-3-22
(1)-D203, 204	ED523427	Silicon Diode 1SS16	45-3-20
(1)-D205, 206	ED557447	Silicon Diode 1S1588	45-3-22
(1)-D207	ED219464	Germanium Diode 1N34A	45-3-1
(1)-SW101	ES257567	Slide SW. CL-106BA8	25-3-125
(1)-SW102	ES303057	Slide SW. 22188	25-3-144
(1)-SW201	ES257332	Slide SW. CL-106B-B5	25-3-124
(1)-VR101	EV464207	Semi-fixed/Vol. V8K4-1 5 kB	36-10-266
(1)-VR102	EV523214	Semi-fixed/Vol. V8K1-1 5 kB	36-10-257
(1)-VR103	EV257523	Semi-fixed/Vol. V8K1-1 500 kB	36-10-267
(1)-VR201	EV464207	Semi-fixed/Vol. V8K4-1 5 kB	36-10-266
(1)-VR202	EV523192	Semi-fixed/Vol. (Metalized Film) TM10K(PV) 1 kB	36-28-1
(1)-VR203	EV522404	Semi-fixed/Vol. V8K1-1 1 kB	36-10-267
(1)-VR204	EV523708	Semi-fixed/Vol. V8K1-1 500 ohms(B)	36-10-267
(1)-VR205	EV478686	Semi-fixed/Vol. V8K4-1 1 kB	36-10-266
(1)-VR207	EV555884	Semi-fixed/Vol. V8K1-1 30 kB	36-10-267
(1)-VR208	EV572747	Semi-fixed/Vol. V8K1-1 100 ohms(B)	36-10-267
(1)-VR210, 211	EV464220	Semi-fixed/Vol. V8K4-1 50 kB	36-10-266
(1)-VR212	EV522404	Semi-fixed/Vol. V8K1-1 1 kB	36-10-267
(1)-VR213	EV523708	Semi-fixed/Vol. V8K1-1 500 ohms(B)	36-10-267
(1)-VR214	EV522404	Semi-fixed/Vol. V8K1-1 1 kB	36-10-267
(1)-L101	EO443722	Ferri Inductor FL9H 1mH(J)	23-1-4
(1)-L102	EO496361	Inductor 6070GE 23mH	23-1-163
(1)-L103	EO244012	Ferri Inductor FL9H 22mH(J)	23-1-4
(1)-L201	EO257422	Ferri Inductor FL5H 27μH(K)	23-1-2
(1)-L202	EO423731	Inductor FS0810S 82μH(J)	23-1-119
(1)-L203	EO574187	Ferri Inductor FL5H 100μH(M)	23-1-2
(1)-L204	EO350796	Ferri Inductor FL5H 330μH(K)	23-1-2
(1)-L205	EO263013	Ferri Inductor FL4H 0.47μF(M)	23-1-1
(1)-L206	EO357287	Ferri Inductor FL5H 100μH(K)	23-1-2
(1)-L207	EO574108	Inductor FS0810S 22μH(J)	23-1-119
(1)-L208, 209	EO423731	Inductor FS0810S 82μH(J)	23-1-119
(1)-L210	EO357287	Ferri Inductor FL5H 100μH(K)	23-1-2
(1)-L211	EO303254	Inductor FS0810S 470μH(J)	23-1-119
(1)-L213	EO485278	Ferri Inductor FL5H 220μH(K)	23-1-2
(1)-L214	EO297202	Inductor FS0810S 8.2μH(J)	23-1-119
(1)-L215	EO485278	Ferri Inductor FL5H 220μH(K)	23-1-2
(1)-L216	EO297202	Inductor FS0810S 8.2μH(J)	23-1-119
(1)-T101	EO261797	OSC. Coil 12A-614	23-4-39
(1)-T201	BT203062	Trans. ZMT-2960	23-1-258
(1)-T202	EO574536	Coil 17K-415	23-1-205
(1)-T203	BT269346	Trans. 12A-605	23-1-270
(1)-T204, 205	EO574525	Coil 20K-036A	23-1-207
(1)-P1	EJ306822	7P Perpendicular Post 171825-7	42-1-143
(1)-P2	EJ257488	Mini Connect. Plug 5048-05A	42-1-99
(1)-P3	EJ305225	Mini Connect. Plug 5048-03AG	42-1-133
(1)-P4	EJ303383	Mini Connect. Plug 5048-08A	42-1-99
(1)-P5	EJ306823	6P Perpendicular Post 171825-6	42-1-143
(1)-P6	EJ306825	12P Perpendicular Post 1-171825-2	42-1-143
(1)-C119	EC496866	Tantalum/C. (DTS Type) 0.47μF(M) 35WV	24-15-8
(1)-C121	EC497924	Tantalum/C. (DTS Type) 0.1μF(M) 35WV	24-15-8
(1)-C134	EC304048	Styrol/C. (w/rubber) 3000PF(J) 500WV	24-11-13
(1)-C205	EC304708	Tantalum/C. (D Type) 47μF(M) 6.3WV	24-15-12
(1)-C208	EC304709	Tantalum/C. (D Type) 0.15μF(M) 35WV	24-15-12
(1)-C210	EC405898	Styrol/C. (Vert. Type) 470PF(J) 50WV	24-11-3
(1)-C225	EC536905	Tantalum/C. (DTS Type) 33μF(K) 10WV	24-15-8
(1)-C244	EC269515	Styrol/C. (Vert. Type) 120PF(J) 50WV	24-11-3
(1)-C245	EC514001	Styrol/C. (Vert. Type) 390PF(J) 50WV	24-11-3

Symbol No.	Parts No.	Description	Schematic No.
(1)-C256	EC590310	Tantalum/C. (DTS. Type) 100μF(M) 10WV	24-15-8
(1)-C265	EC435690	Styrol/C. (Vert. Type) 560PF(J) 50WV	24-11-3
(1)-C266	EC517116	Tantalum/C. (DTS Type) 33μF(M) 10WV	24-15-8
(1)-C285	EC261808	Through Type/C. CK-472F2H 102SY (US)	24-21-2
(1)-VC201, 202	EC257354	Trimmer/C. ECV-1ZW 20×44 20PF	24-2-39

(2) SERVO P.C BOARD (PY-5203) BLOCK

Symbol No.	Parts No.	Description	Schematic No.
(2)-1	BA303545	Servo P.C Board Comp. VT-350 (US)	
(2)-2	BA303546	Servo P.C Board Comp. VT-350 (CCIR)	
(2)-IC1to4	EI257602	IC MC14011B	45-8-173
(2)-IC5	EI639505	IC MC14001CP	45-8-121
(2)-IC6	EI301748	IC μPC1458C	45-8-230
(2)-IC7	EI639483	IC MC14024BCP	45-8-123
(2)-IC8	EI301749	IC μPC741C	45-8-229
(2)-IC9	EI302172	IC TA7120P(D)(E)	45-8-149
(2)-IC10	EI213827	IC μPC305C	45-8-190
(2)-TR1,2	ET639437	Transistor 2SC945L(Q)(P)	45-1-85
(2)-TR3,4	ET557965	Transistor 2SA733(Q)(R)	45-1-124
(2)-TR5	ET639437	Transistor 2SC945L(Q)(P)	45-1-85
(2)-TR6	ET304710	Transistor 2SC944S(K)(P)	45-1-286
(2)-TR7	ET639437	Transistor 2SC945L(Q)(P)	45-1-85
(2)-TR8	ET304710	Transistor 2SC944S(K)(P)	45-1-286
(2)-TR9,10	ET639437	Transistor 2SC945L(Q)(P)	45-1-85
(2)-TR11	ET666404	Transistor 2SD571(K)(L)	45-1-218
(2)-TR12,13	ET557965	Transistor 2SA733(Q)(R)	45-1-124
(2)-TR14	ET639437	Transistor 2SC945L(Q)(P)	45-1-85
(2)-TR15	ET666404	Transistor 2SD571(K)(L)	45-1-218
(2)-TR16to18	ET639437	Transistor 2SC945L(Q)(P)	45-1-85
(2)-TR19,20	ET557965	Transistor 2SA733(Q)(R)	45-1-124
(2)-TR21	ET639437	Transistor 2SC945L(Q)(P)	45-1-85
(2)-TR22,23	ET557965	Transistor 2SA733(Q)(R)	45-1-124
(2)-TR24,25	ET538378	Transistor 2SA733(R)	45-1-124
(2)-TR26to28	ET639437	Transistor 2SC945L(Q)(P)	45-1-85
(2)-TR29	ET538378	Transistor 2SA733(R)	45-1-124
(2)-TR30	ET302169	Transistor 2SD471(K)(L)(M)	45-1-283
(2)-TR31	ET639437	Transistor 2SC945L(Q)(P)	45-1-85
(2)-TR32	ET666415	Transistor 2SB605(K)(L)	45-1-225
(2)-D1to4	ED557447	Silicon Diode 1S1588	45-3-22
(2)-D6,7	ED560913	Silicon Diode 1S2473 VE	45-3-23
(2)-D8	ED511097	Silicon Diode 1N4001	45-2-50
(2)-D9	ED624903	Silicon Diode 1S2473	45-3-28
(2)-D10to20	ED560913	Silicon Diode 1S2473 VE	45-3-23
(2)-D21	ED624903	Silicon Diode 1S2473	45-3-28
(2)-D22to31	ED560913	Silicon Diode 1S2473 VE	45-3-23
(2)-VR1	EV592277	Semi-fixed/Vol. (metalized Film) TM10K(PH) 2 kB	36-28-3
(2)-VR2	EV464220	Semi-fixed/Vol. V8K4-1 50 kB	36-10-266
(2)-VR3	EV589408	Semi-fixed/Vol. V8K4-1 200 ohms(B)	36-10-266
(2)-VR4	EV464218	Semi-fixed/Vol. V8K4-1 30 kB	36-10-266
(2)-VR5,6	EV520806	Semi-fixed/Vol. V8K4-1 10 kB	36-10-266
(2)-VR7	EV523620	Semi-fixed/Vol V8K4-1 500 ohms(B)	36-10-266
(2)-VR8	EV464231	Semi-fixed/Vol. V8K4-1 100 kB	36-10-266
(2)-SW1	ES601806	Slide SW. SSC222A	25-3-102
(2)-RL1	EP302294	Relay MZ-9HG	47-2-29
(2)-TH1	ED302293	Thermister 32D26	45-5-24
(2)-TH2	ED302292	Thermister 25D29	45-5-28
(2)-L1	EO346230	Inductor RX 22mH	23-1-15
(2)-P1	EJ257433	Mini Connect. Plug 5048-10A	42-1-99
(2)-P2,3	EJ257488	Mini Connect. Plug 5048-05A	42-1-99
(2)-P4	EJ257433	Mini Connect. Plug 5048-10A	42-1-99
(2)-P5	EJ257556	Mini Connect. Plug 5048-06A	42-1-99
(2)-P6	EJ257861	Mini Connect. Plug 5048-03A	42-1-99
(2)-R9	ER302289	Metal Oxide Film/R. EF 1/4W 10k(J)	35-17-8
(2)-R11	ER302289	Metal Oxide Film/R. EF 1/4W 10k(J)	35-17-8
(2)-R12	ER302291	Metal Oxide Film/R. EF 1/4W 270k(J)	35-17-8
(2)-R18	ER302290	Metal Oxide Film/R. EF 1/4W 200k(J) (US)	35-17-8
(2)-R18	ER258085	Metal Oxide Film/R. EF 1/4W 300k(J) (CCIR)	35-17-8
(2)-R25	ER302156	Metal Oxide Film/R. EF 1/4W 4.7k(J)	35-17-8
(2)-R26	ER302157	Metal Oxide Film/R. EF 1/4W 5.1k(J)	35-17-8
(2)-R66	ER258085	Metal Oxide Film/R. EF 1/4W 300k(J)	35-17-8
(2)-R67	ER302291	Metal Oxide Film/R. EF 1/4W 270k(J)	35-17-8
(2)-R68	ER258085	Metal Oxide Film/R. EF 1/4W 300k(J)	35-17-8
(2)-R122	ER302168	Metal Oxide Film/R. 1/2W 10 ohms(K)	35-15-12
(2)-C4	EC497946	Tantalum/C. (DTS Type) 0.68μF(M) 35WV(US)	24-15-8
(2)-C4	EC496877	Tantalum/C. (DTS Type) 1μF(M) 35WV(CCIR)	24-15-8
(2)-C5	EC301380	Tantalum/C. (DTS Type) 47μF(M) 10WV	24-15-8
(2)-C6	EC522167	Solid Aluminum/C. (Vert. Type) 0.22μF(M) 25WV	24-19-2
(2)-C16	EC593065	Tantalum/C. (DTS Type) 3.3μF(M) 25WV	24-15-8
(2)-C17	EC574075	Tantalum/C. (DTS Type) 10μF(M) 10WV	24-15-8
(2)-C18	EC572444	Tantalum/C. (DTS Type) 47μF(M) 6.3WV(US)	24-15-8
(2)-C18	EC302298	Tantalum/C. 68μF(M) 6.3WV(CCIR)	24-15-8
(2)-C33,34	EC593065	Tantalum/C. (DTS Type) 3.3μF(M) 25WV	24-15-8
(2)-C35	EC572444	Tantalum/C. (DTS Type) 47μF(M) 6.3WV	24-15-8
(2)-C45	EC601841	Tantalum/C. (DTS Type) 0.47μF(K) 35WV	24-15-8
(2)-C50	EC305289	Tantalum/C. (D Type) 15μF(M) 3.15WV	24-15-12

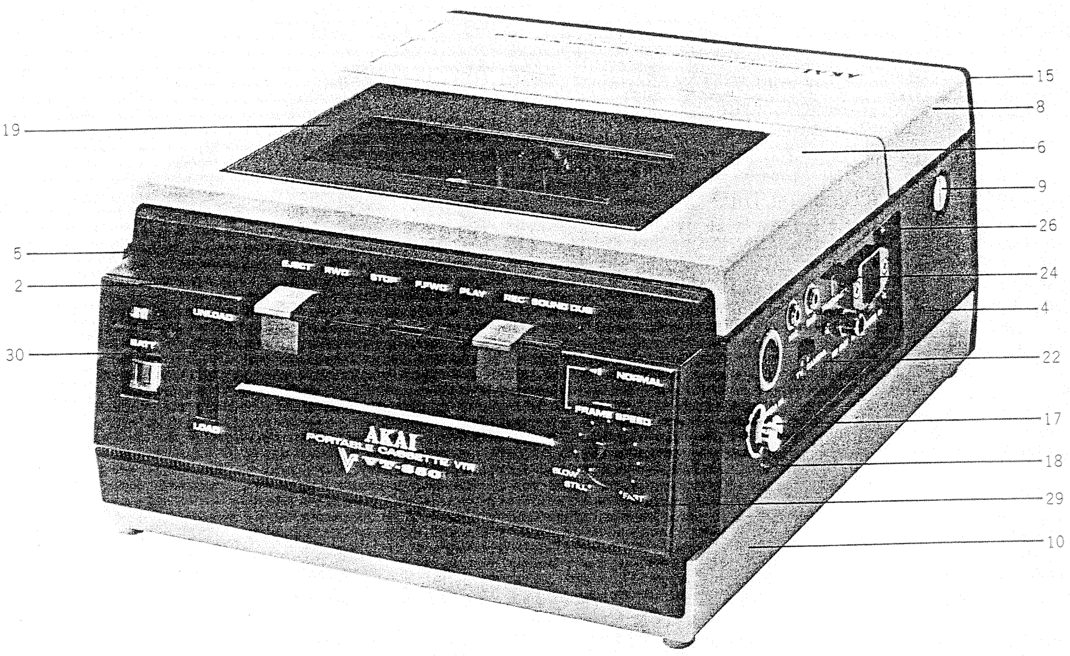
(3) SSG P.C BOARD (PY-5200) BLOCK

Symbol No.	Parts No.	Description	Schematic No.
(3)-1	BA302433	SSG P.C Board Comp. VT-350 (US)	
(3)-2	BA302434	SSG P.C Board Comp. VT-350 (CCIR)	
(3)-IC1	EI257580	IC MC14011CP	45-8-173
(3)-IC2	EI301381	IC MN-115P (US)	45-8-223
(3)-IC2	EI301382	IC MN-116P (CCIR)	45-8-224
(3)-TR1	ET522268	Transistor 2SA733(Q)	45-1-124
(3)-TR2	ET453486	Transistor 2SC711(E)(F)	45-1-67
(3)-TR3	ET522268	Transistor 2SA733(Q)	45-1-124
(3)-TR4	ET453486	Transistor 2SC711(E)(F)	45-1-67
(3)-TR5	ET522268	Transistor 2SA733(Q)	45-1-124
(3)-TR6,7	ET453486	Transistor 2SC711(E)(F)	45-1-67
(3)-TR8	ET522268	Transistor 2SA733(Q)	45-1-124
(3)-D1,2	ED560913	Silicon Diode 1S2473 VE	45-3-23
(3)-D3to5	ED624903	Silicon Diode 1S2473	45-3-28
(3)-C13	EC434070	Styrol/C. (Vert. Type) 680PF(J) 50WV	24-11-3
(3)-L1,2	EO357287	Ferri Inductor FL5H 100μH(K)	23-1-2
(3)-X1	EI309427	Crystal Osc. 31.5 kHz (US)	53-1-144
(3)-X1	EI309426	Crystal Osc. 31.25 kHz (CCIR)	53-1-144
(3)-P1	EJ302158	Mini Connect. Plug 5049-08A	42-1-120

(4) PLG P.C BOARD (PY-2200) BLOCK

Symbol No.	Parts No.	Description	Schematic No.
(4)-1	BA303350	PLG P.C Board Comp. VT-350	PY-9808
(4)-TR1	ET639437	Transistor 2SC945L(Q)(P)	45-1-85
(4)-TR2	ET557965	Transistor 2SA733(Q)(R)	45-1-124
(4)-TR3	ET635220	Transistor 2SC945L(K)(P)	45-1-85
(4)-TR4	ET238735	Transistor 2SA715WT(C)(D)	45-1-255
(4)-TR5,6	ET557965	Transistor 2SA733(Q)(R)	45-1-124
(4)-TR7	ET634421	Transistor 2SC1518(Q)(R)	45-1-210
(4)-D1	ED560913	Silicon Diode 1S2473 VE	45-3-23
(4)-D2	ED224526	Silicon Diode 10D1	45-2-11
(4)-D3,4	ED560913	Silicon Diode 1S2473 VE	45-3-23
(4)-D5,6	ED219464	Germanium Diode 1N34A	45-3-1
(4)-D7,8	ED224526	Silicon Diode 10D1	45-2-11
(4)-C5	EC575188	Tantalum/C. (DTS Type) 22μF(M) 16WV	24-15-8
(4)-P1	EJ257927	Mini Connect. Plug 5048-12A	42-1-99

9. PHOTO OF FINAL ASSEMBLY BLOCK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STOP
F.FWD
PLAY
REC SOUND DUB
UNLOAD
LOAD
NORMAL
FRAME SPEED
SLOW
STILL
FAST
AKAI
PORTABLE CASSETTE VTR
VT-350

9) FINAL ASSEMBLY BLOCK

Ref. No.	Parts No.	Description	Schematic No.
9-1x	ZS325495	Tapping Screw #2, 3x6 (BR)	
9-2	BC303842	Front Case Assy VT-350	PY-9802
9-3x	ZS379350	Screw, pan head 3x6	
9-4	BC238623	Side Case (R)	PY-6003
9-5	BC238645	Side Case (L)	PY-6003
9-6	BC238680	Upper Case (A) (US)	PY-6005
9-7	BC281485	Upper Case (A-1) (CCIR)	PY-6005
9-8	BC303887	Upper Case (C)	PY-6006/6047
9-9	ZS304320	Decorative Screw (B)	PY-6076
9-10	BC238713	Bottom Case	PY-6007
9-11x	ZS201150	Screw, truss head 3x6 (Black)	
9-12x	VT260853	Battery Case Lid	PY-6008
9-13x	VT356580	Nylatch Grommet H322-2-1	
9-14x	EP356591	Nylatch Plunger H323-2-3-1	
9-15	BC260820	Rear Case	PY-6011
9-16x	MH579633	Stop Pin	CV-1100
9-17	ZS579835	Handle Holder Screw	CV-1099
9-18	MZ579824	Tube	CV-1098
9-19	VT280405	Ejector Panel Part VT-300	PY-9813
9-20x	ZS608152	Screw, pan head 2.3x6 (Black)	
9-21x	ZS267254	Screw, pan head 2.3x4 (Black)	
9-22	SP303137	Decoration Panel (A-1) (US)	PY-6056/6065
9-23x	SP303138	Decoration Panel (B-1) (CCIR)	PY-6056/6065
9-24	SK458583	Tracking Knob	PX-A181
9-25x	ZS466773	Screw, countersunk head 1.7x6 P=0.35 (Black)	
9-26	ZS591254	Screw, truss head 2.3x6 (Black)	
9-27x	HZ303288	Rotary Head Shield Plate (B)	PY-8067
9-28x	ZS201396	Screw, pan head 2.3x3	
9-29	SK303745	Control Knob	PY-6202
9-30	SB303816	Loading Button	PY-1227

10. LIST OF INTERCHANGEABLE SEMICONDUCTORS

If, while servicing, the original parts cannot be obtained, the interchangeable parts listed below can be substituted.

Original Parts			Interchangeable Parts	
Description	Parts No.	Utilizing P.C Board	Description	Parts No.
2SA715WT (C) (D)	ET238735	PY-2200		
2SA733 (Q)	ET522268	PY-5022, PY-5200		
2SA733 (R)	ET538378	PY-5203		
2SA733 (Q) (R)	ET557965	PY-2200, PY-5201, PY-5203		
2SB605 (K) (L)	ET666415	PY-5201, PY-5203	2SA720 (Q) (R)	ET554736
2SC711 (E) (F)	ET453486	PY-5022, PY-5200		
2SC944S (K) (P)	ET304710	PY-5203		
2SC945L (K)	ET658102	PY-5201		
2SC945L (Q) (P)	ET639437	PY-2200, PY-5203		
2SC945L (Q) (R)	ET398711	PY-5022		
2SC1216 (F)	ET572703	PY-5022		
2SC1247A (V)	ET520288	PY-5022		
2SC1518 (Q) (R)	ET634421	PY-2200	2SC1449 (K) (L) (M)	ET635815
2SC1568 (Q) (R)	ET303256	PY-5022		
2SC1674 (K) (L)	ET646132	PY-5022		
2SD571 (K) (L)	ET666404	PY-5203	2SC1384 (Q) (R)	ET565852
2SD471 (K) (L) (M)	ET302169	PY-5203		
2SK19 (BL)	ET423224	PY-5022		
1N34A	ED219464	PY-2200, PY-5022	1S1588AM	ED562386
1N4001	ED511097	PY-5201, PY-5203	10D1	ED224526
1SS16	ED523427	PY-5022		
1S1588	ED557447	PY-5022, PY-5203	1S2473	ED624903
1S2473	ED624903	PY-5200, PY-5203	1S1588	ED557447
1S2473VE	ED560913	PY-2200, PY-5201, PY-5022, PY-5200, PY-5203	1S1588	ED557447
10D1	ED224526	PY-2200, PY-5201	1N4002	ED511907

INDEX

Parts No.	Ref. No. & Symbol No.	Parts No.	Ref. No. & Symbol No.	Parts No.	Ref. No. & Symbol No.	Parts No.	Ref. No. & Symbol No.
BA302431	6-102	ED523427	(1)-D203,204	EO350796	(1)-L204	ET557965	(2)-TR19,20
BA302433	(3)-1	ED557447	6-110x	EO357287	(1)-L206	ET557965	(2)-TR22,23
BA302434	(3)-2	ED557447	(1)-D201,202	EO357287	(1)-L210	ET557965	(4)-TR2
BA303350	(4)-1	ED560913	6-119x	EO357287	(3)-L1,2	ET557965	(4)-TR5,6
BA303351	6-113x	ED560913	(1)-D101	EO423731	(1)-L202	ET572703	(1)-TR201,202
BA303545	(2)-1	ED560913	(2)-D6,7	EO423731	(1)-L208,209	ET634421	(4)-TR7
BA303546	(2)-2	ED560913	(2)-D10to20	EO443722	(1)-L101	ET635220	(4)-TR3
BA303548	(1)-1	ED560913	(2)-D22to31	EO485278	(1)-L213	ET639437	(2)-TR1,2
BA303549	(1)-2	ED560913	(3)-D1,2	EO485278	(1)-L215	ET639437	(2)-TR5
BC238623	9-4	ED560913	(4)-D1	EO496361	(1)-L102	ET639437	(2)-TR7
BC238645	9-5	ED560913	(4)-D3,4	EO574108	(1)-L207	ET639437	(2)-TR9,10
BC238680	9-6	ED557447	(1)-D205,206	EO574187	(1)-L203	ET639437	(2)-TR14
BC238713	9-10	ED557447	(2)-D1to4	EO574525	(1)-T204,205	ET639437	(2)-TR16to18
BC260820	9-15	ED624903	6-47x	EO574536	(1)-T202	ET639437	(2)-TR21
BC281485	9-7	ED624903	(2)-D9	EO669273	6-104x	ET639437	(2)-TR26to28
BC303842	9-2	ED624903	(2)-D21	EP257940	6-115x	ET639437	(2)-TR31
BC303887	9-8	ED624903	(3)-D3to5	EP261180	3-15	ET639437	(4)-TR1
BC430637	7-1	EF497406	7-8	EP302294	(2)-RL1	ET646132	(1)-TR217
BK303479	4-1x	EF620280	7-9x	EP303575	6-44	ET646132	(1)-TR220
BL271372	7-2	EI213827	(2)-IC10	EP303906	6-1	ET646132	(1)-TR222
BM291183	2-55	EI257580	(3)-IC1	EP356591	9-14x	ET658102	6-117x
BM300851	2-59	EI257602	(2)-IC1to4	ER258085	(2)-R18	ET666404	(2)-TR11
BM302672	3-1	EI297180	(1)-IC204	ER258085	(2)-R66	ET666404	(2)-TR15
BM303920	6-19	EI297191	(1)-DL201	ER258085	(2)-R68	ET666415	6-116x
BR301745	6-155	EI301381	(3)-IC2	ER302156	(2)-R25	ET666415	(2)-TR32
BR301746	6-154	EI301382	(3)-IC2	ER302157	(2)-R26	EV238375	6-101
BT203062	(1)-T201	EI301748	(2)-IC6	ER302168	(2)-R122	EV257523	(1)-VR103
BT238364	6-90x	EI301749	(2)-IC8	ER302289	(2)-R9	EV303763	6-121
BT267906	6-91x	EI302172	(2)-IC9	ER302289	(2)-R11	EV464207	(1)-VR101
BT269346	(1)-T203	EI309426	(3)-X1	ER302290	(2)-R18	EV464207	(1)-VR201
BV303480	6-6	EI309427	(3)-X1	ER302291	(2)-R12	EV464218	(2)-VR4
BV303844	2-1	EI572681	(1)-IC201	ER302291	(2)-R67	EV464220	(1)-VR210,211
BV303845	2-2x	EI572692	(1)-IC203	ER658124	6-111x	EV464220	(2)-VR2
BV303873	2-64	EI634454	(1)-IC101	ES238353	6-94x	EV464231	(2)-VR8
BV303877	6-88x	EI639483	(2)-IC7	ES246598	6-129	EV478686	(1)-VR205
BV303878	6-89x	EI639505	(2)-IC5	ES257231	6-103x	EV520806	(2)-VR5,6
BV303879	6-14	EJ232132	6-131	ES257332	(1)-SW201	EV522404	6-112x
BV303921	5-1x	EJ238162	6-132	ES257567	(1)-SW101	EV522404	(1)-VR203
BV304104	2-49	EJ238173	6-138x	ES302282	6-114x	EV522404	(1)-VR212
EA301753	2-19	EJ238195	6-136x	ES302287	6-122	EV522404	(1)-VR214
EC257354	(1)-VC201,202	EJ238228	6-145x	ES303057	(1)-SW102	EV523192	(1)-VR202
EC261808	(1)-C285	EJ238285	6-143x	ES304788	6-127	EV523214	(1)-VR102
EC269515	(1)-C244	EJ238318	6-96	ES477966	3-47	EV523620	(2)-VR7
EC301380	(2)-C5	EJ238331	6-98	ES477966	6-126x	EV523708	(1)-VR204
EC302298	(2)-C18	EJ257433	(2)-P1	ES477966	7-13	EV523708	(1)-VR213
EC304048	(1)-C134	EJ257433	(2)-P4	ES601806	(2)-SW1	EV555884	(1)-VR207
EC304708	(1)-C205	EJ257488	(1)-P2	ET238735	(4)-TR4	EV572747	(1)-VR208
EC304709	(1)-C208	EJ257488	(2)-P2,3	ET302169	(2)-TR30	EV589408	(2)-VR3
EC305289	(2)-C50	EJ257556	(2)-P5	ET303256	(1)-TR204	EV592277	(2)-VR1
EC405898	6-93x	EJ257861	(2)-P6	ET303828	6-146	HC261292	3-40
EC405898	(1)-C210	EJ257927	(4)-P1	ET304710	(2)-TR6	HE271541	2-30
EC412593	6-92x	EJ281057	6-137x	ET304710	(2)-TR8	HE271552	2-31
EC434070	(3)-C13	EJ302158	(3)-P1	ET362261	6-107x	HR271506	2-14x
EC435690	(1)-C265	EJ303216	6-166x	ET398711	(1)-TR218	HR300298	2-13
EC496866	(1)-C119	EJ303347	6-140x	ET398711	(1)-TR221	HZ280056	2-25
EC496877	(2)-C4	EJ303383	(1)-P4	ET398711	(1)-TR223	HZ303288	9-27x
EC497924	(1)-C121	EJ303858	6-144x	ET423224	(1)-TR216	MB253574	3-38
EC497946	(2)-C4	EJ305224	6-139x	ET423224	(1)-TR219	MB253866	6-84
EC514001	(1)-C245	EJ305225	(1)-P3	ET453486	(1)-TR101	MB422267	6-159
EC517116	(1)-C266	EJ305229	6-100	ET453486	(1)-TR203	MC256792	6-37
EC522167	(2)-C6	EJ306816	6-133x	ET453486	(1)-TR206to209	MI253776	3-36
EC536905	(1)-C225	EJ306817	6-141x	ET453486	(1)-TR211	MH251763	4-7x
EC572444	(2)-C18	EJ306819	6-142x	ET453486	(1)-TR214,215	MH579633	9-16x
EC572444	(2)-C35	EJ306820	6-134x	ET453486	(1)-TR224	ML251223	6-86
EC574075	(2)-C17	EJ306821	6-135x	ET453486	(3)-TR2	ML252336	6-41
EC575188	6-120x	EJ306822	(1)-P1	ET453486	(3)-TR4	ML252617	6-31
EC575188	(4)-C5	EJ306823	(1)-P5	ET453486	(3)-TR6,7	ML253855	3-4
EC590310	(1)-C256	EJ306825	(1)-P6	ET515733	6-105x	ML255341	6-29
EC593065	(2)-C16	EJ308892	6-95	ET520288	(1)-TR103	ML255521	6-85
EC593065	(2)-C33,34	EL256893	6-62	ET520288	(1)-TR212	ML255543	6-81
EC601841	(2)-C45	EM304443	6-83	ET522268	(3)-TR1	ML255677	6-77
ED219464	6-118x	EO244012	(1)-L103	ET522268	(1)-TR210	ML255780	6-78
ED219464	(1)-D207	EO257321	7-7	ET522268	(3)-TR3	ML303912	6-7
ED219464	(4)-D5,6	EO257422	(1)-L201	ET522268	(3)-TR5	ML304222	6-82
ED224526	6-109x	EO261797	(1)-T101	ET522268	(3)-TR8	ML304324	6-79
ED224526	(4)-D2	EO263013	(1)-L205	ET538378	(2)-TR24,25	ML305971	2-40
ED224526	(4)-D7,8	EO297202	(1)-L214	ET538378	(2)-TR29	ML305979	2-41
ED302292	(2)-TH2	EO297202	(1)-L216	ET557965	6-106x	MP256184	2-51
ED302293	(2)-TH1	EO303254	(1)-L211	ET557965	(2)-TR3,4	MR253642	6-72
ED511097	(2)-D8	EO346230	(2)-L1	ET557965	(2)-TR12,13	MR253787	6-20

INDEX

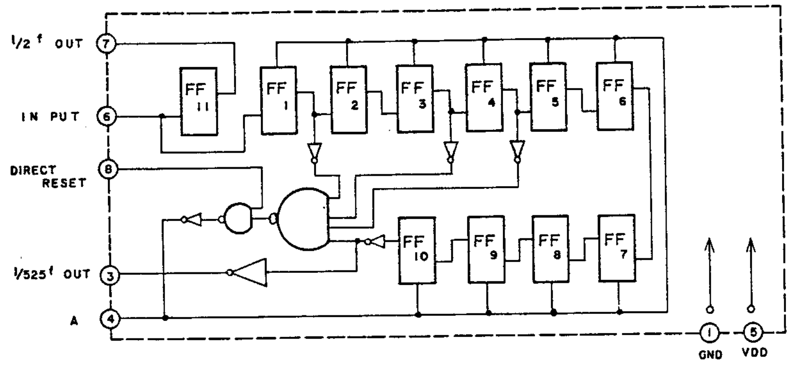
Parts No.	Ref. No. & Symbol No.	Parts No.	Ref. No. & Symbol No.	Parts No.	Ref. No. & Symbol No.	Parts No.	Ref. No. & Symbol No.
MR305258	3-2	ZG251943	3-11	ZS425992	6-97	ZW396437	6-57
MS251818	4-5	ZG251954	3-18	ZS427048	2-60	ZW402287	3-13
MS254035	4-25	ZG251965	4-11	ZS432674	6-80x	ZW414145	3-21x
MS254193	2-27	ZG251976	3-27	ZS432843	3-3	ZW414145	6-42
MS254204	2-34	ZG251998	2-43	ZS432843	6-36	ZW414145	6-153x
MS254226	2-35	ZG252000	2-28	ZS432843	6-46	ZW438557	2-20
MS254542	4-27	ZG252033	2-36	ZS433315	2-53	ZW460787	4-2
MS254845	3-32	ZG252630	6-64	ZS447761	6-161x	ZW511457	6-156
MV261246	3-23	ZG252630	6-68	ZS447761	7-11	ZW550642	6-167x
MV300808	3-22	ZG252720	6-21	ZS460440	2-32	ZW550697	6-124
MZ302272	6-34	ZG252865	3-9	ZS460440	6-38	ZW616004	6-164x
MZ303913	6-12	ZG252898	3-8	ZS466773	9-25x	ZW623687	6-65
MZ579824	9-18	ZG255857	4-13	ZS481454	7-5		
MZ802980	2-45	ZG301379	6-69	ZS483456	6-73		
VT238421	2-66	ZG303711	6-24	ZS487091	6-128		
VT238432	2-71	ZG303730	4-4	ZS487091	6-130x		
VT252393	6-45	ZG303741	4-6	ZS487091	7-15		
VT252808	3-39	ZG303742	5-4	ZS499331	6-147		
VT253260	2-11	ZG303752	2-68	ZS524812	3-41		
VT253552	2-39	ZG303801	6-59	ZS553983	6-165x		
VT253585	5-9	ZG303817	6-9	ZS579835	9-17		
VT253618	5-10	ZG304711	2-44	ZS590073	6-15		
VT253631	5-14	ZG305162	6-71	ZS591254	9-26		
VT253732	2-69	ZG362801	3-14	ZS592378	6-125		
VT253877	6-61	ZG365433	2-50	ZS608152	9-20x		
VT253890	5-13	ZG385571	4-10	ZS608321	6-22		
VT253901	4-28	ZG451574	4-22	ZS608444	6-162x		
VT253945	2-3	ZG451574	6-51	ZS609120	6-33		
VT254171	2-52	ZG456120	6-43	ZS670004	3-46		
VT254384	5-5	ZG516418	6-25	ZS670004	6-149		
VT255227	2-26	ZS200676	6-87	ZW258840	2-62		
VT255723	3-44	ZS201150	9-11x	ZW259738	2-70		
VT256127	3-34	ZS201194	2-4	ZW259738	3-6		
VT258838	2-21	ZS201396	9-28x	ZW259738	5-2		
VT260853	9-12x	ZS201407	4-15	ZW259738	6-28x		
VT265680	6-75	ZS201407	6-5	ZW259738	7-14		
VT266231	3-5	ZS201407	6-55	ZW267232	5-12		
VT266321	6-35	ZS201418	2-10	ZW269954	6-18		
VT280001	3-29	ZS201475	2-23x	ZW270088	2-29		
VT280405	9-19	ZS201936	2-12	ZW270088	3-20		
VT280866	2-58	ZS261336	2-7	ZW270088	7-6		
VT291150	2-5	ZS262260	3-43	ZW270101	2-46		
VT300551	6-50	ZS262607	6-151x	ZW270101	3-7		
VT300638	4-23	ZS267254	5-11	ZW270101	5-3		
VT302032	2-24	ZS267254	9-21x	ZW270101	6-8		
VT303219	2-6	ZS269256	2-56	ZW270101	7-10		
VT303291	2-18	ZS269267	2-57	ZW270123	3-33		
VT303368	2-17	ZS269627	3-45	ZW270123	4-8		
VT303717	6-70	ZS285750	2-33	ZW270123	6-58		
VT303719	6-48	ZS303936	6-60	ZW273745	2-61		
VT303724	6-123	ZS304320	9-9	ZW273745	6-11		
VT303726	6-26	ZS305504	3-12	ZW273756	2-38		
VT303746	2-37	ZS323728	6-76	ZW273756	3-31x		
VT303798	6-53	ZS325495	6-30	ZW273756	6-108x		
VT303807	6-4	ZS325495	9-1x	ZW273802	2-54x		
VT303886	6-10	ZS327835	6-74	ZW273802	3-30x		
VT303809	6-17	ZS344305	6-163x	ZW273835	2-63		
VT305570	6-56	ZS356804	2-8	ZW273914	6-16x		
VT308144	6-49	ZS356837	2-22	ZW288764	3-35		
VT356580	9-13x	ZS379350	3-25	ZW300888	4-16x		
VT357041	2-15	ZS379350	3-28	ZW300888	6-54x		
VT422537	6-99	ZS379350	6-32	ZW301319	5-7		
SB303816	9-30	ZS379350	9-3x	ZW301319	6-157		
SK251256	4-21	ZS383951	5-6	ZW302332	3-19		
SK251278	4-20	ZS391476	3-37	ZW303789	6-150x		
SK253822	4-17	ZS414033	3-24x	ZW305546	2-48x		
SK253833	4-18	ZS417161	2-67	ZW305549	6-158		
SK253844	4-19	ZS417161	3-10	ZW305556	6-52		
SK303745	9-29	ZS417161	4-12	ZW305556	6-66x		
SK458583	9-24	ZS417161	6-63	ZW306068	3-17		
SP303137	9-22	ZS417216	2-65	ZW334653	6-23		
SP303138	9-23x	ZS417216	3-16	ZW356657	2-42		
ZG251234	4-14	ZS417216	6-2	ZW356657	4-26		
ZG251447	7-3	ZS419938	2-9	ZW356657	6-3		
ZG251458	7-4	ZS419940	2-16	ZW356657	6-39		
ZG251504	4-24	ZS421806	6-148x	ZW357164	4-3		
ZG251605	6-67	ZS421806	6-152x	ZW357164	6-13		
ZG251662	4-9	ZS422076	3-26	ZW381644	2-47x		
ZG251853	5-8	ZS422076	6-27	ZW381644	6-40		
ZG251875	3-42	ZS422076	7-12	ZW394086	6-160x		

SECTION 3

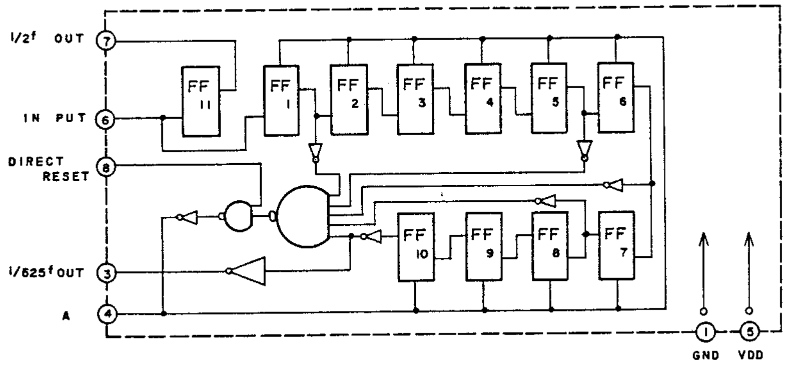
SCHEMATIC DIAGRAM

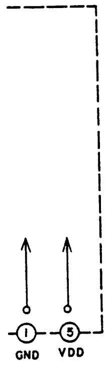
1. VT-350 NO. 3-1 1561658A BLOCK DIAGRAM
2. VT-350 SIGNAL NO. 3-2 1561659A SCHEMATIC DIAGRAM
3. VT-350 SERVO NO. 3-3 1561660A SCHEMATIC DIAGRAM

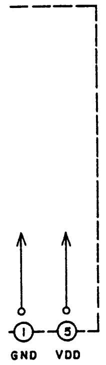
MN115P

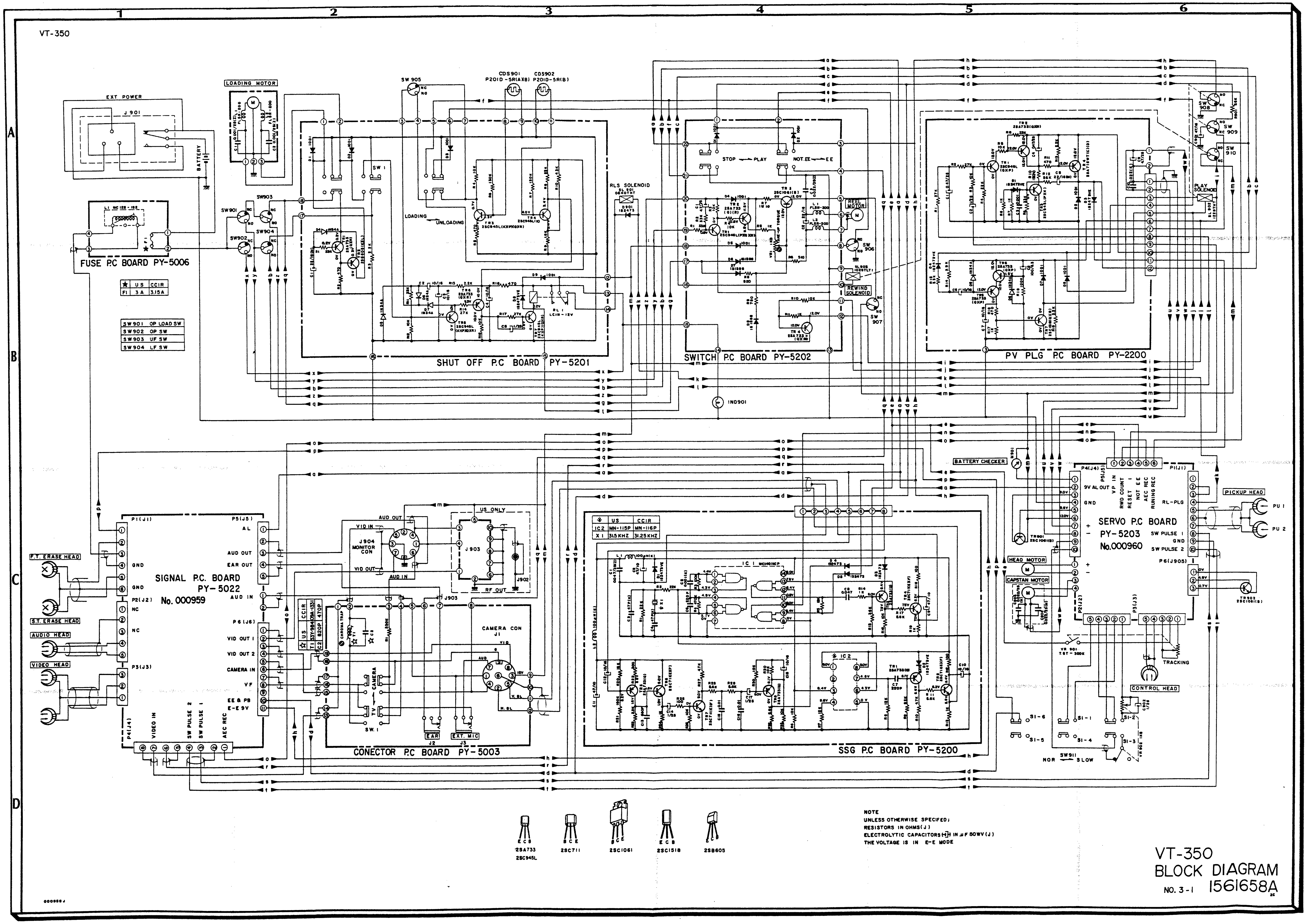

1/2 f OUT
7
IN PUT
6
DIRECT RESET
8
1/525f OUT
3
A
4
FF 11
FF 1
FF 2
FF 3
FF 4
FF 5
FF 6
FF 10
FF 9
FF 8
FF 7
1
GND
5
VDD

MN116P


1/2f OUT
7
IN PUT
6
DIRECT RESET
8
1/625f OUT
3
A
4
FF 11
FF 1
FF 2
FF 3
FF 4
FF 5
FF 6
FF 10
FF 9
FF 8
FF 7
1
GND
5
VDD







VT-350
EXT POWER
J 901
BATTERY
LOADING MOTOR
FUSE P.C BOARD PY-5006
SW901
SW902
SW903
SW904
SW 905
CDS901 P201D-5R(A)(B)
CDS902 P201D-5R(B)
LOADING
UNLOADING
SHUT OFF P.C BOARD PY-5201
RLS SOLENOID
STOP — PLAY
NOT.EE — EE
REEL MOTOR
REWIND SOLENOID
SW 906
SW 907
SWITCH P.C BOARD PY-5202
IND901
PV PLG P.C BOARD PY-2200
PLAY SOLENOID
SW 908
SW 909
SW 910
BATTERY CHECKER
SERVO P.C BOARD - PY-5203 No.000960
PICKUP HEAD
PU 1
PU 2
HEAD MOTOR
CAPSTAN MOTOR
TRACKING
CONTROL HEAD
NOR — SLOW
SW911
F.T. ERASE HEAD
S.T. ERASE HEAD
AUDIO HEAD
VIDEO HEAD
SIGNAL P.C. BOARD PY-5022 No. 000959
J904 MONITOR CON
US ONLY
J 903
J902
RF OUT
CAMERA CON J1
EAR
EXT. MIC
CONECTOR P.C BOARD PY-5003
SSG P.C BOARD PY-5200
IC 1
IC 2
2SA733
2SC945L
2SC711
2SC1061
2SC1518
2SB605

★	US	CCIR
F1	3A	3.15A

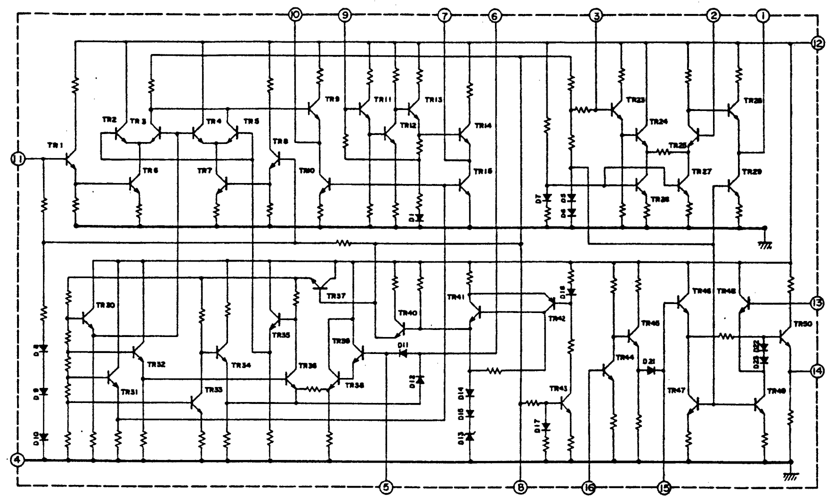
SW901	OP LOAD SW
SW902	OP SW
SW903	UF SW
SW904	LF SW

★	US	CCIR
IC2	MN-115P	MN-116P
X1	31.5KHZ	31.25KHZ

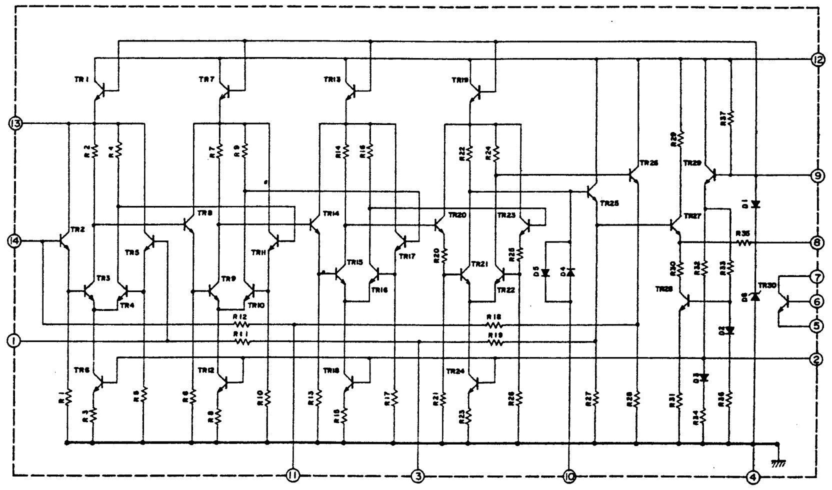
NOTE
UNLESS OTHERWISE SPECIFED;
RESISTORS IN OHMS(J)
ELECTROLYTIC CAPACITORS IN µF 50WV(J)
THE VOLTAGE IS IN E-E MODE

VT-350
BLOCK DIAGRAM
NO. 3-1 1561658A

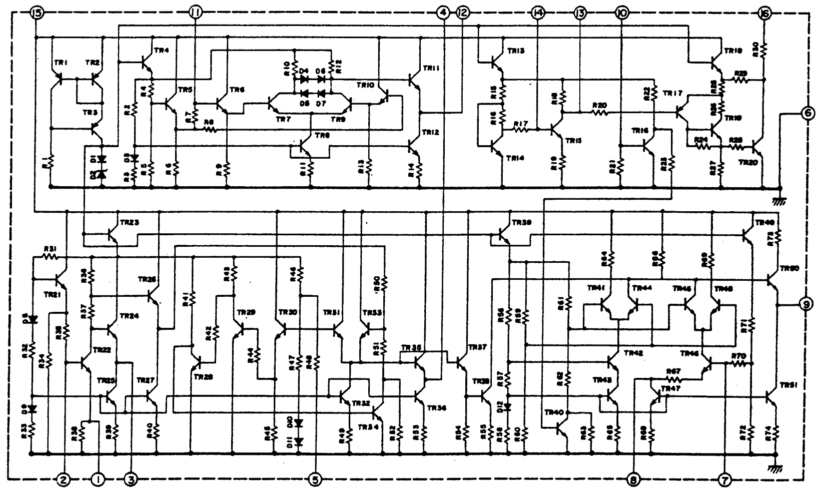
AN302



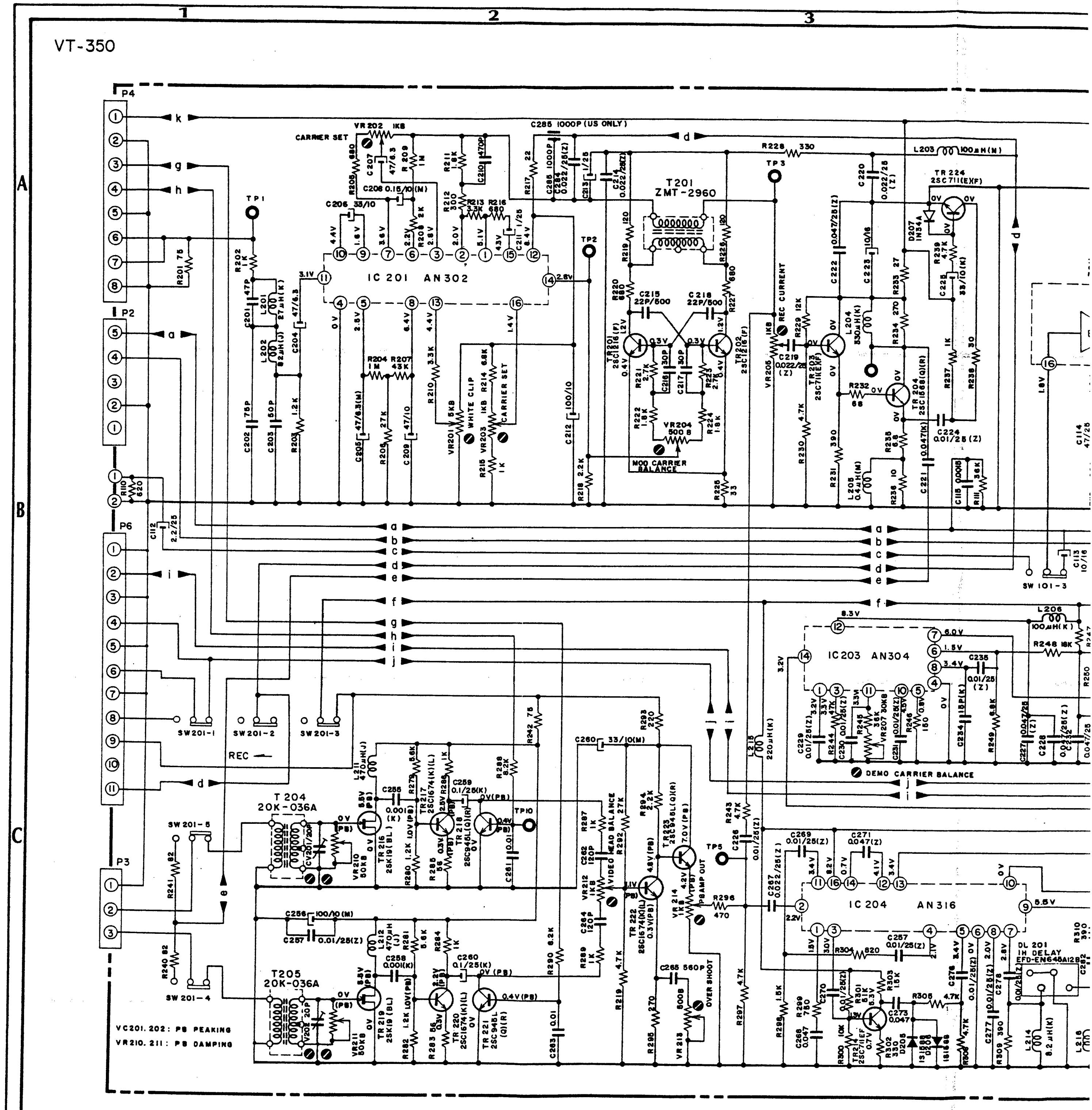
AN304

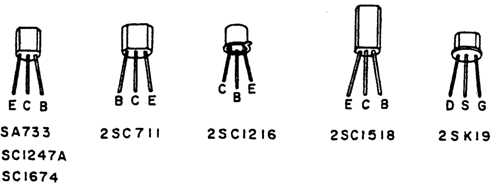


AN316



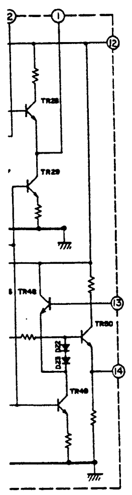
VT-350

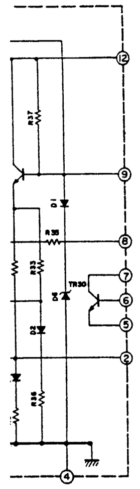

1
2
3
A
B
C
D
P4
P2
P6
P3
IC 201 AN302
IC203 AN304
IC 204 AN316
T201 ZMT-2960
T 204 20K-036A
T205 20K-036A
VR 202 1KB CARRIER SET
VR204 500 B MOD CARRIER BALANCE
VR201 5KB WHITE CLIP
VR203 1KB CARRIER SET
DEMO CARRIER BALANCE
REC CURRENT
C285 1000P (US ONLY)
TP1
TP2
TP3
TP5
TP10
SW201-1
SW201-2
SW201-3
SW201-4
SW201-5
SW 101-3
REC
L203 100μH(M)
TR 224 2SC711(EXF)
DL 201 1H DELAY EFD-EN648A12B
VIDEO HEAD BALANCE
PBAMP OUT
OVER SHOOT
VC201, 202: PB PEAKING
VR210, 211: PB DAMPING

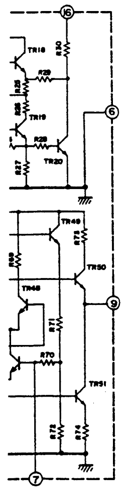

E C B
B C E
C B E
E C B
D S G
2SA733
2SC1247A
2SC1674
2SC711
2SC1216
2SC1518
2SK19

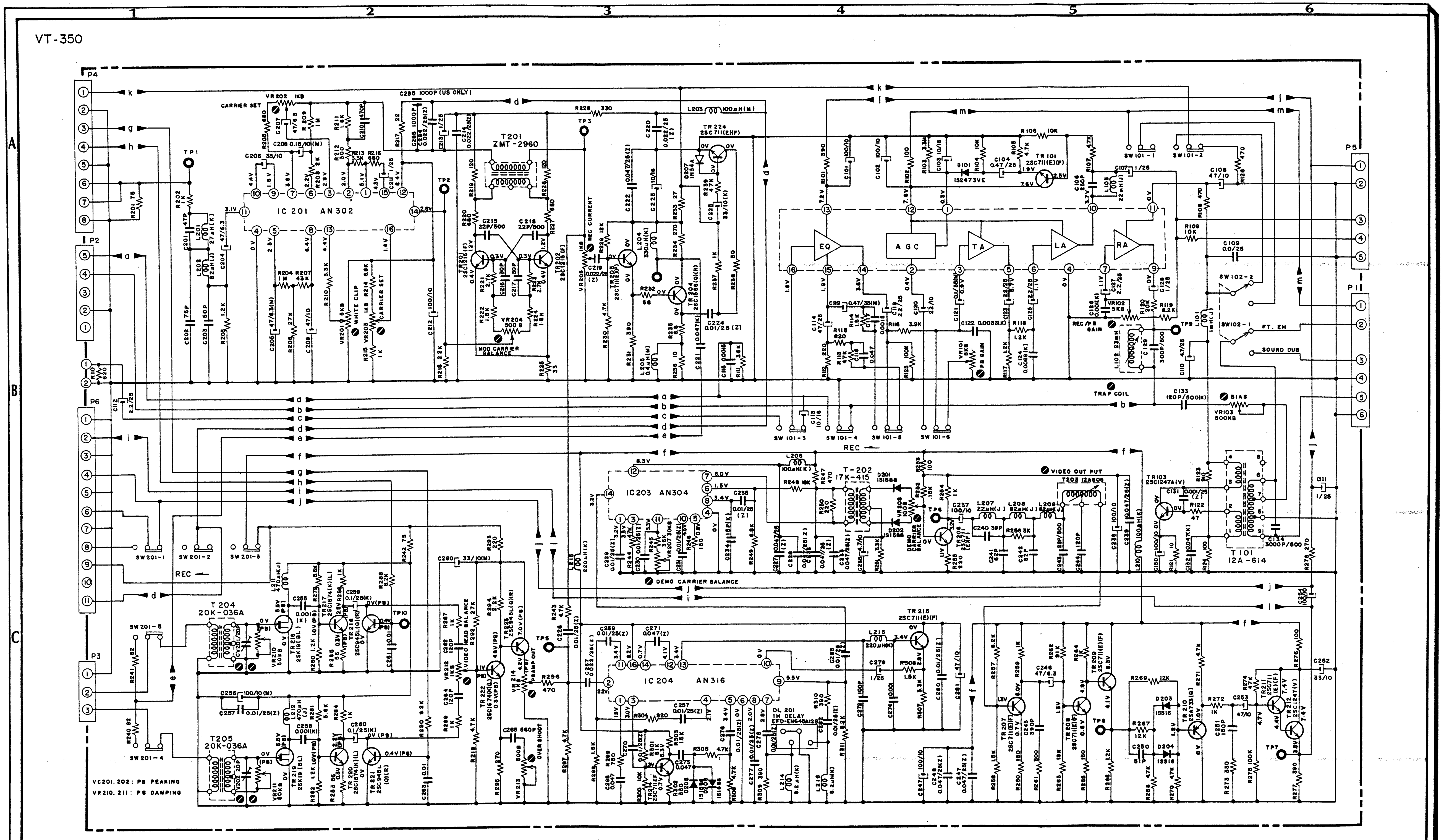
NOTE
UNLESS O
.RESISTOR
CAPACITO
UNLESS O

000959F








VT-350
1
2
3
4
5
6
A
B
C
D
P4
P2
P6
P3
P5
P1
IC 201 AN302
IC203 AN304
IC 204 AN316
T201 ZMT-2960
T-202 17K-415
T203 12A606
T 101 12A-614
T 204 20K-036A
T205 20K-036A
TP1
TP2
TP3
TP5
TP6
TP7
TP8
TP9
TP10
CARRIER SET
VR202 1KB
C285 1000P (US ONLY)
MOD CARRIER BALANCE
REC CURRENT
WHITE CLIP
EQ
AGC
TA
LA
RA
SW101-1
SW101-2
SW101-3
SW101-4
SW101-5
SW101-6
SW102-1
SW102-2
FT. EH
SOUND DUB
TRAP COIL
BIAS
VR103 500KB
REC/PB GAIN
PB GAIN
VIDEO OUT PUT
DEMO CARRIER BALANCE
SW201-1
SW201-2
SW201-3
SW201-4
SW201-5
REC
VIDEO LEVEL
OVER SHOOT
DL 201 1H DELAY EFD-EN646A128
VC201, 202: PB PEAKING
VR210, 211: PB DAMPING
000959F

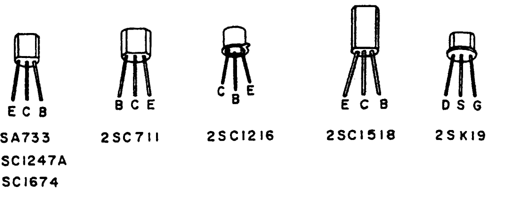
NOTE

UNLESS OTHERWISE SPECIFIED;

RESISTORS IN OHMS (j)

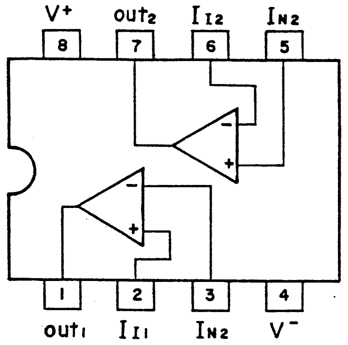
CAPACITORS IN μF 50WV (j)

UNLESS OTHERWISE SPECIFIED THE VOLTAGE IS IN E-E MODE

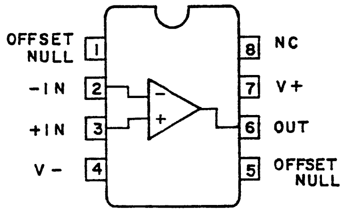

E C B
2SA733
2SC1247A
2SC1674
B C E
2SC711
C B E
2SC1216
E C B
2SC1518
D S G
2SK19

VT-350 SIGNAL
SCHEMATIC DIAGRAM
NO. 3-2 1561659A
2C

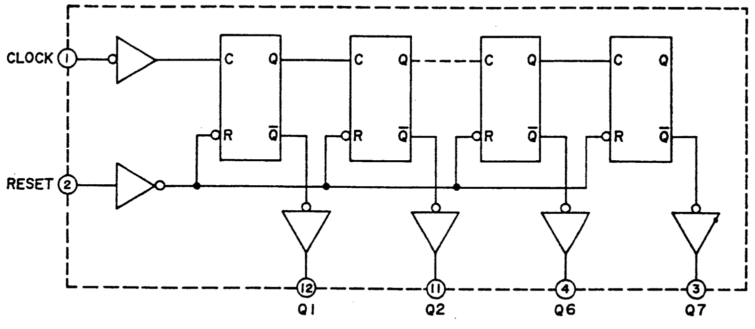
µPC1458C


V+
out2
I I2
I N2
8
7
6
5
1
2
3
4
out1
I I1
I N2
V⁻

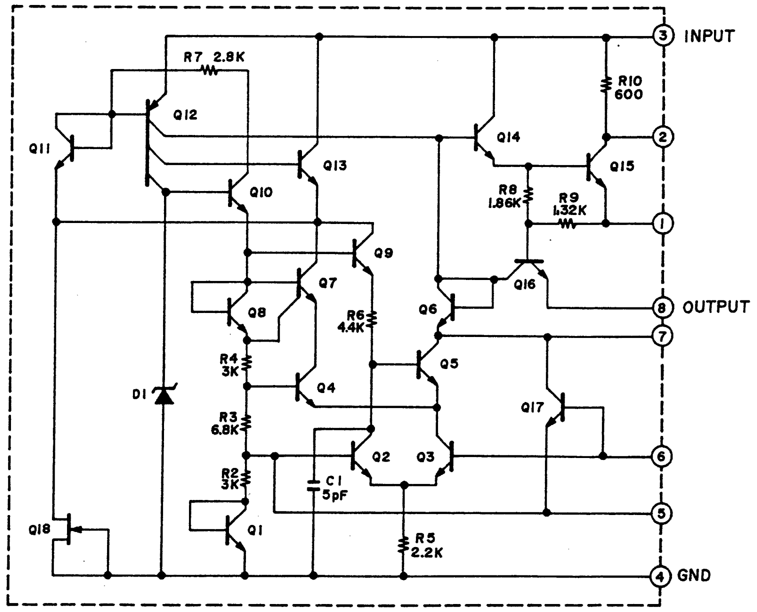
µPC741C

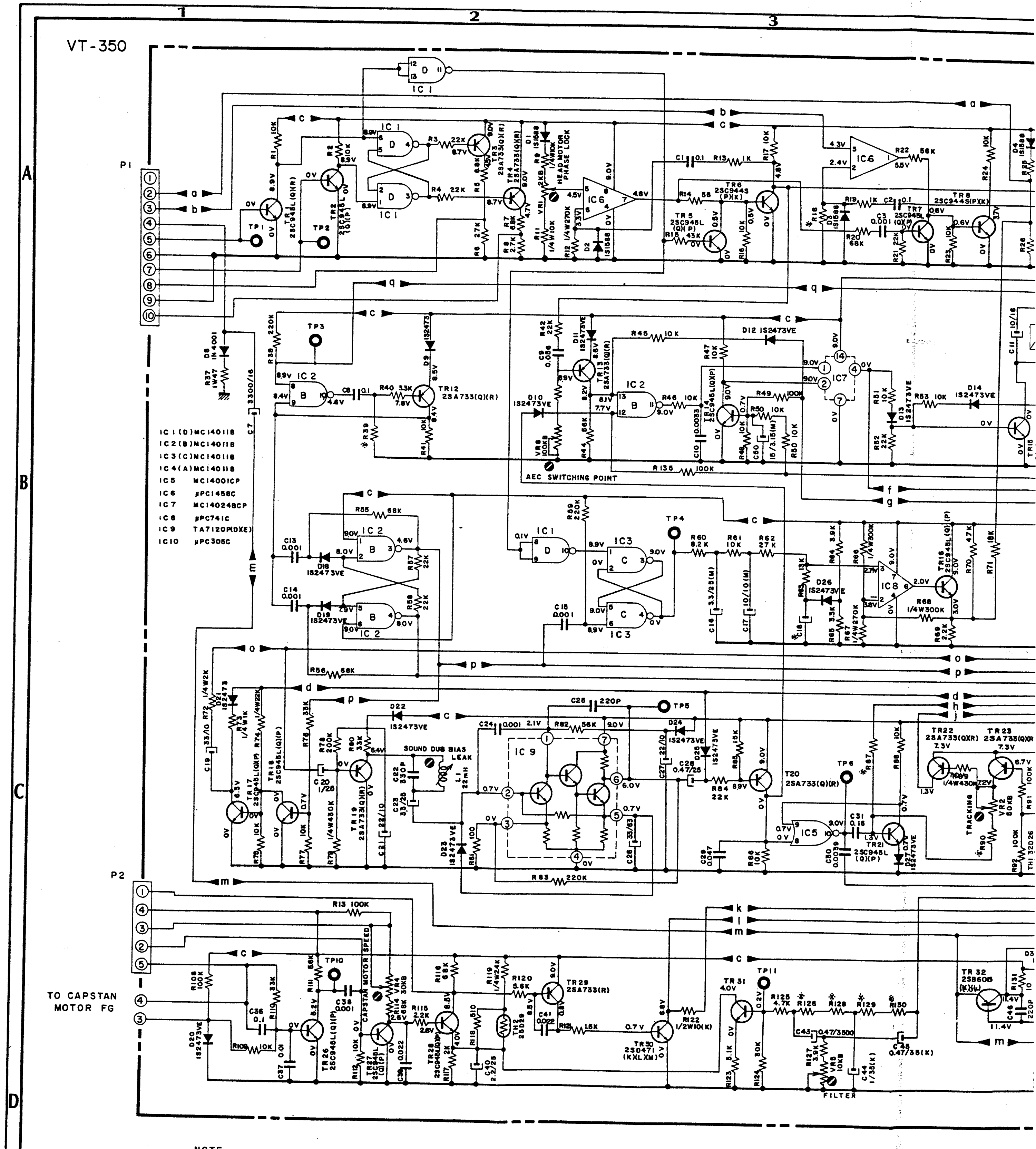

OFFSET NULL
-IN
+IN
V-
1
2
3
4
8
7
6
5
NC
V+
OUT
OFFSET NULL

MC14024CP


CLOCK
RESET
1
2
C
Q
R
Q̄
12
11
4
3
Q1
Q2
Q6
Q7

µPC305C


INPUT
3
R7 2.8K
R10 600
Q11
Q12
Q13
Q14
Q15
Q10
R8 1.86K
R9 1.32K
2
1
Q9
Q7
Q8
Q16
R6 4.4K
Q6
OUTPUT
8
7
R4 3K
Q4
Q5
D1
R3 6.8K
Q17
R2 3K
C1 5pF
Q2
Q3
6
5
Q1
Q18
R5 2.2K
4
GND


1
2
3
A
B
C
D
VT-350
P1
P2
TO CAPSTAN MOTOR FG
HEAD MOTOR PHASE LOCK
AEC SWITCHING POINT
SOUND DUB BIAS LEAK
CAPSTAN MOTOR SPEED
TRACKING
FILTER
TP1
TP2
TP3
TP4
TP5
TP6
TP10
TP11

IC1(D)	MC14011B
IC2(B)	MC14011B
IC3(C)	MC14011B
IC4(A)	MC14011B
IC5	MC14001CP
IC6	µPC1458C
IC7	MC140248CP
IC8	µPC741C
IC9	TA7120P(DXE)
IC10	µPC305C

NOTE
UNLESS OTHERWISE SPECIFID;
RESISTORS IN OHMS 1/8W(J)
CAPACITORS IN µF 50WV (J)
THE VOLTAGE IS IN E-E MODE

※

	R18	R33	R39	R43	R87	R90	R126	R128	R129
U.S.	1/4W200K	20K	160K	240K	47K	100K	11K	100	11K
CCIR	1/4W300K	15K	200K	300K	82K	120K	13K	560	13K

0009601

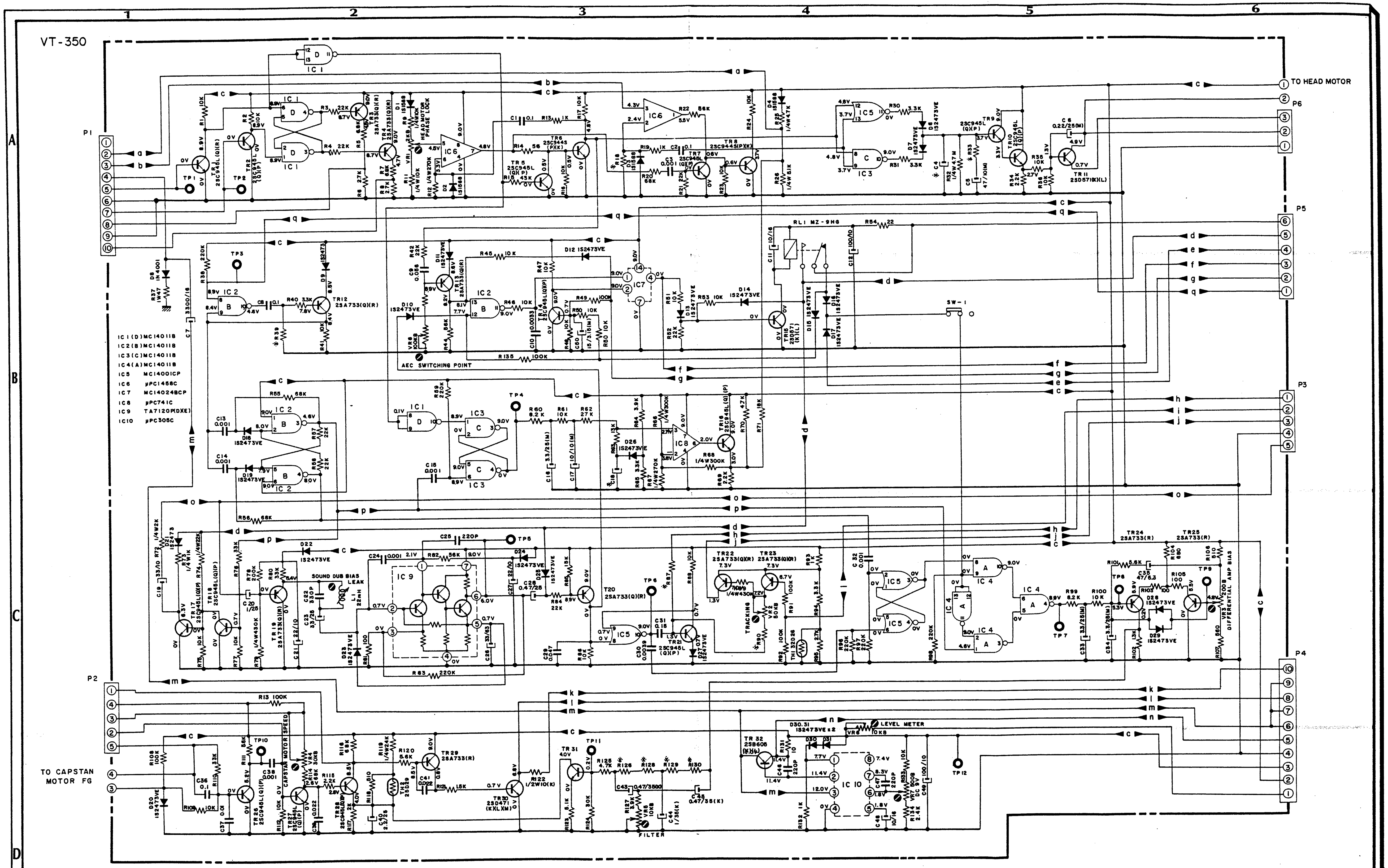
SET
ULL

7

UT

TPUT

D

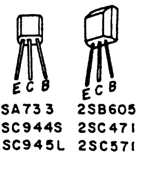

1
2
3
4
5
6
A
B
C
D
VT-350
P1
P2
P3
P4
P5
P6
TO HEAD MOTOR
TO CAPSTAN MOTOR FG
HEAD MOTOR PHASE LOCK
AEC SWITCHING POINT
SOUND DUB BIAS LEAK
CAPSTAN MOTOR SPEED
TRACKING
LEVEL METER
FILTER
DIFFERENTIAL AMP BIAS
RL1 MZ-9HG
SW-1
IC1(D)MC14011B
IC2(B)MC14011B
IC3(C)MC14011B
IC4(A)MC14011B
IC5 MC14001CP
IC6 μPC1458C
IC7 MC14024BCP
IC8 μPC741C
IC9 TA7120P(OXE)
IC10 μPC305C
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12

NOTE
UNLESS OTHERWISE SPECIFID;
RESISTORS IN OHMS 1/8W(J)
CAPACITORS IN μF 50WV (J)
THE VOLTAGE IS IN E-E MODE

0009601

※

	R18	R33	R39	R43	R87	R90	R126	R128	R129	R130	C4	C18
U.S.	1/4W200K	20K	160K	240K	47K	100K	11K	100	11K	100	0.68/25(M)	47/6.3(M)
CCIR	1/4W300K	15K	200K	300K	82K	120K	13K	560	13K	560	1/35(M)	68/63(M)



2SA733　2SB605
2SC944S　2SC471
2SC945L　2SC571

VT-350 SERVO SCHEMATIC DIAGRAM

NO. 3-3 1561660A 2C